



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

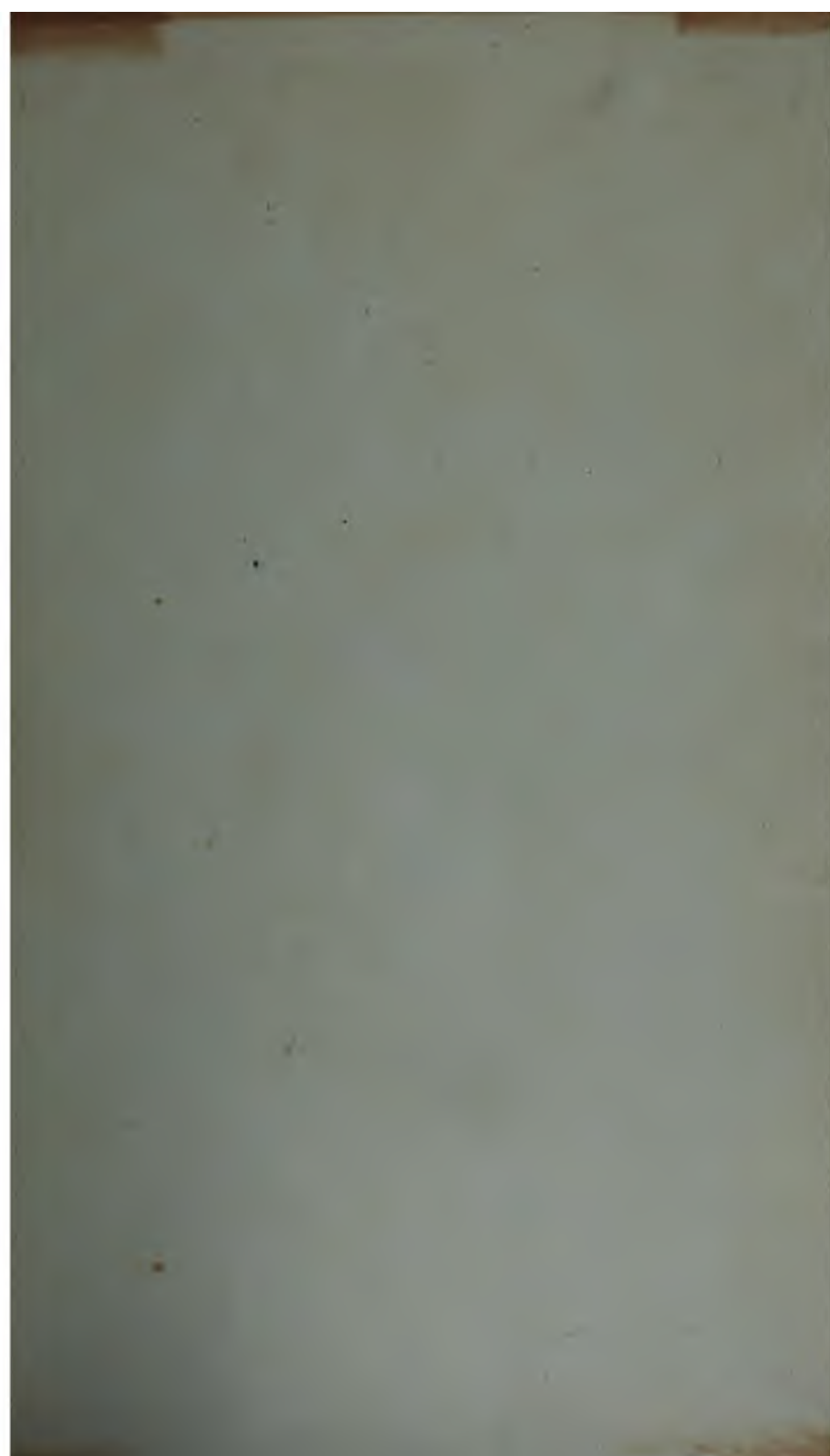
Stanford University Libraries

3 6105 013 934 133



E 6147





THE
ENTOMOLOGIST

An Illustrated Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. LUCAS DISTANT, F.E.S., &c.

EDWARD A. FITCH, F.L.S., F.E.S.

F. W. FROHAWK, F.E.S.

MARTIN JACOBY, F.E.S.

W. F. KIRBY, F.L.S., F.E.S.

G. W. KIRKALDY, F.E.S.

W. J. LUCAS, B.A., F.E.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

G. H. VERRALL, F.E.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

VOLUME THE THIRTY-EIGHTH.

LONDON: L. AND ST. MARTIN'S LANE.

LONDON: L. AND ST. MARTIN'S LANE.

WEST, NEWMAN & CO., 54, HATTON GARDEN.

SIMPKIN, MARSHALL, HAMILTON, KENT & CO., LIMITED.

1905.

131765



YHAKU
ROKUL. OROHAT. QIA. BU
YTI28VIMU

LIST OF CONTRIBUTORS.

- ADKIN, ROBERT, F.E.S., 311
ALDERSON, MISS E. MAUDE, F.E.S., 136
ANDERSON, JOSEPH, 313, 314
ARKLE, J., 165, 189, 290
BANKES, EUSTACE R., M.A., F.E.S., 162, 275, 313
BARRETT, C. G., 135
BARRETT, J. P., 214, 215
BATTERSBY, FRANCIS J., 238
BAUMANN, R. T., 215
BAXTER, T., 281, 283
BELL, S. J., 262, 320
BENTALL, E. E., 62
BLANFORD, W. T., 110
BORDU, ARTHUR, 260
BOGUE, W. A., 26
BROOKS, G., 120
BURR, MALCOLM, B.A., F.E.S., &c., 185
BUTLER, W. E., F.E.S., 280, 281
CAMERON, PETER, 14, 21, 83, 105, 153, 170, 223, 227, 249, 268
CAMPION, F. W., 282
CAMPION, F. W. & H., 24, 298
CAMPION, H., 282
CANSDALE, W. D., F.E.S., 239
CAPPER, SAMUEL JAMES, F.E.S., 240
CHAPMAN, T. A., M.D., F.E.S., 1, 38, 73, 90, 213
CHITTENDEN, D., 260
CLARKE, A. LIONEL, 186
CLAXTON, REV. W., 240
CLUTTERBUCK, C. GRANVILLE, 91, 215
COCKERELL, PROF. T. D. A., 23, 33, 58, 104, 111, 145, 217, 236, 237, 258, 270, 302, 309
CORBIN, G. B., 311
CROFT, J. A., 27, 93
DADD, E. M., F.E.S., 200, 226
DALE, C. W., F.E.S., 313
DISTANT, W. L., F.E.S., &c., 121, 169, 194
DONCASTER, L., 111
DRABBLE, ERIC, D.Sc., F.L.S., 310
ELLIS, CLAUDE L., 314
FLETCHER, T. BAINBRIGGE, R.N., F.E.S., 18
FORSYTHE, C. H., 86, 108, 133, 158, 180, 185, 186, 199
FOSTER, A. H., 280
FREKE, PERCY E., F.E.S., 149
FROHAWK, F. W., F.E.S., 26, 193, 283
FRYER, H. F., F.E.S., 125
FRYER, G. C. F., 125
GENTRY, E. G., 311
GIBBS, A. E., F.L.S., 79, 137, 138
GILLES, W. S., 237
GOSS, H., F.L.S., F.E.S., &c., 68
GRELLET, H. R., 238
HALL, ARTHUR, 228
HARRISON, W. B., 96, 192
HARVEY-JELLIE, REV. B., 282
HEATH, DR. E. A., F.L.S., 74, 97
HODGE, HAROLD, 283
HOLLAND, C. B., 260
HORRELL, E. CHARLES, 92
JACKSON, R. A., 258
JEDDERE-FISHER, CUTHBERT, 63
JOY, E. C., 185
KENYON, H. D., 162
KINDER, A. B., 22
KIRBY, W. F., F.L.S., F.E.S., 244
KIRKALDY, G. W., F.E.S., 56, 76, 120, 127, 173, 195, 231, 255, 304
KNAGGS, DR. H. G., 240
LANG, HENRY CHARLES, M.D., F.E.S., &c., 122
LATHY, PERCY I., F.Z.S., F.E.S., 226, 254
LITTLER, FRANK M., F.E.S., &c., 11
LOCK, GEORGE, 161
LOWE, REV. FRANK E., M.A., 61
LUCAS, W. J., B.A., F.E.S., 72, 91, 111, 178, 266, 281, 282, 283, 296, 313
LAYLE, G. T., 25
MANSBRIDGE, WILLIAM, F.E.S., 116, 289
MELDOLA, PROF. R., F.R.S., F.E.S., 90
MILLER, J., 260
MORGAN, E. D., 92
MORRIS, J. B., 22
MUTCH, J. P., 161
OLDAKER, F. A., 64
PAGE, W. T., F.Z.S., 25, 62
PHILLIPS, W. E., 311
PLUM, H. V., 135, 185
PROUT, LOUIS B., F.E.S., 6, 43
RAYNOR, REV. GILBERT, 22, 280
RICHARDS, PERCY, 25, 239
ROLLASON, W. A., 63, 92, 93, 94
ROSE, ALBERT F., M.D., 49
ROTHSCHILD, HON. WALTER, D.Sc., M.P., &c., 125
ROWLAND-BROWN, H., M.A., F.E.S., 29, 95, 117, 140, 165, 190, 213, 241, 243, 273, 285, 309, 318
SHARP, DR. DAVID, M.A., F.R.S., &c., 161
SICH, ALFRED, F.E.S., 259, 309

SIMMONDS, HERBERT W., F.E.S., 187	THURNALL, A., 239, 281, 310
SMITH, W., 91	TOMLIN, J. R. LE B., 31, 69, 119, 167, 288
SOPP, E. J. B., F.E.S., &c., 31, 69, 96, 112, 119, 167, 192, 288	TURNER, HY. J., F.E.S., 31, 68, 96, 119, 140, 166, 191, 216, 261, 286, 319
SOUTH, RICHARD, F.E.S., 24, 26, 27, 32, 61, 62, 72, 92, 94, 98, 112, 120, 137, 140, 142, 161, 162, 185, 213, 215, 238, 262, 263, 264, 265, 280, 282, 288, 312	VINALL, HUGH J., 61
SPEYER, E. R., 314	WAINWRIGHT, COLBRAN J., F.E.S., 70, 120, 168, 216
STAFFORD, L., 162	WALLER, Rev. A. P., 215, 283
STANDEN, R. S., F.L.S., F.E.S., 250, 277, 299	WHITTLE, F. G., 239, 260
STONEILL, B., 67, 238, 239	WIGGELSWORTH, ROBERT J., 71, 168
THEOBALD, FRED. V., M.A., 52, 101, 142, 154, 224	WIGHTMAN, A. J., 66, 314
	WOODBIDGE, FRANCIS C., 161, 259
	YOUNG, S. L. ORFORD, 316

PLATES.

- PLATE I. The Earlier Stages of *Cataclysta lemnata*, L.
 „ II. British Waterbugs.

ILLUSTRATIONS IN THE TEXT.

	PAGE
Ungues of <i>Anisocheleomyia nivipes</i>	53
Fore Ungues of <i>Anisocheleomyia alboannulata</i>	55
Cryptic Form and Colouring in <i>Melitæa</i> Larvæ	73
Three New Beetles from West Africa	75
Two New Beetles from Angola	97
A New Species of Cicadidæ, <i>Gæana vestita</i>	121
Pupa of <i>Lycæna arion</i>	193
<i>Lycæna orbitulus</i> , <i>L. oberthuri</i> , and <i>L. pyrenaica</i>	241
Aberration of <i>Euchelia</i> (<i>Hipocrita</i>) <i>jacobææ</i>	265
Forceps of Earwigs	266
Melanic Form of <i>Acronycta leporina</i>	289

INDEX.

GENERAL.

- Aberration of *Euchelia* (*Hipocrita*) *ja-*
cobææ (fig.), 266
 Abundance of *Pieris brassicæ* in West
 Meath, 238
 A Butterfly Hunt in the Pyrenees, 243,
 273
 Academic Honours conferred on Com.
 J. J. Walker, 213
Acherontia atropos in London, 260; on
 the Lancashire Coast, 283
Æschna cyanea, 283; mixta in Epping
 Forest, 24
 A Few Captures from North Cornwall in
 1903, 92
 A Guide to the Study of British Water-
 bugs, 173, 231
 A New Forest Holiday, 314
 A List of the Macro-Lepidoptera of
 Lancaster and District, 86, 108, 133,
 158, 180, 199
 An Abbreviated List of Butterflies from
 the South of France and Corsica, 49
 An interesting Melanic Form of *Acro-*
nycta leporina, 289
 A New Genus and Species of Larridæ
 from Central America, 21
 A New Genus of Culicidæ, 52
 A New Genus of Hemitelini from Cape
 Colony, 249
 A New Pest of the Orange, 258
 A New Race of *Morpho adonis*, Cram.,
 226
 A New Species of *Nodaria* from Japan,
 74
 A New *Stegomyia* from the Transvaal,
 224
 A Note on some Species of *Prepona*, 254
Apamea ophiogramma, 161
Aporia cratægi, 215
 A Preliminary List of the Lepidoptera
 of Malta, 18
 A Raid by *Nabis limbatus*, 281
 Barrett's Lepidoptera, 135
 Bibliographical Notes on the Hemiptera,
 76, 304
 Breeding Dragonflies from the Egg, 110
 Butterflies collected by Surgeon Lam-
 bert, R.N., at Valdimar Bay, &c.,
 August, 1897, 122
 Butterflies of France, 309
Campodea staphylinus, 280, 313
 Captures at Light in Clapham, 1904,
 66
 Captures from Wyre Forest in 1904,
 63
Catocala fraxini in Suffolk, 283
Cerura bicuspis in Lancashire, 186
Cimex, the Linnean Genus, 110, 304
Colias edusa at Fleet, Hants, 283
Colias edusa, *C. hyale*, &c., at Folke-
 stone, 25
Colias edusa reared from Ova in 1904,
 22
 Collecting Diptera at Light, 236
 Collecting in West Cornwall during
 1903, 1904, 93
 Cryptic Form and Colouring in *Melitæa*
Larvæ, 73
 Current Notes, 56, 127, 195, 255
Cymatophora ocularis and *Agrotis ra-*
vida at Hitchin, 238
Cymatophora octogesima (*ocularis*) in
 Epping Forest, 215
Deilephila livornica bred from the Egg,
 313; in Cornwall, 162; in Gloucester,
 1905, 186; in Wales, 162
 Descriptions of a New Genus and some
 New Species of East Indian Hymeno-
 ptera, 14
 Descriptions of a New Genus and Species
 of Braconidæ from Cape Colony, 268
 Description of a New Species of Aradidæ
 from Ceylon, 194
 Description of a New Species of Cica-
 didæ, 121
 Description of a New Species of Gaster-
 uption from Cape Colony, 227
 Description of a New Species of Lygeidæ
 from South Africa, 169
 Description of a New Species of Pseud-
 agenia from Natal, 223
 Description of *Lycæna arion* pupa, ♂,
 193
 Descriptions of Three New Beetles from
 the Gold Coast and Angola, West
 Africa, 74
 Descriptions of Three Undescribed

- Genera of Ichneumonidæ from Borneo, 170
 Descriptions of Two New Aculeate Hymenoptera from the Transvaal, 153
 Descriptions of Two New Beetles from Angola, 97
Dichorampha flavidorsana, Knaggs = *quæstionana*, Zell., 240
 Dragonfly Season of 1904, 178
 Dytiscids in the New Forest, 161
- Early hibernation of *Vanessa urticæ*, 281, 311
 Entomology at Barmouth, 290
Epiblema (*Phlæodes*) *immundana*, F. R., 281, 311
 Errata, 138, 168
Eupithecia stevensata, 161
 Exotic Earwigs wanted, 185
- Gynandrous Example of *Lachneis lanestris*, 29; of *Lycæna ægon*, 114; of *Lycæna icarus*, 114; of *Saturnia pavonia*, 29; of *Smerinthus populi*, 114
- Hornet and Butterfly, 309
 Hybrid Notodont, 94, 261; Saturnid, 117; *Smerinthus*, 114, 164; Zygænid, 118
- Larva of *Thecla rubi* on Dogwood, 185
 Late Appearance of *Colias edusa*, 25; of *Pyrameis atalanta*, 25, 62
 Late Flight of Dragonflies, 313
 Lepidoptera at Kingston, Surrey, 25
 Lepidoptera at Light in Reigate and Dorking, 1904, 64; collected at Clapham, 239,—in Central America, 228; in Hertfordshire, 137; of the Lincolnshire Coast, 79
Leucania favicolor, Barrett, 215
Leucophaea surinamensis, L., breeding in Britain, 111
Leucophaea surinamensis, Linn., in Essex, 92
Lictor Cane-moth, 11
Limacodes testudo in Gloucestershire, 215
Limenitis sibylla, 282; in August? 62
Locusta viridissima, 283
 London Lepidoptera, 161
Lucanus cervus at Chichester, 313
Lycæna bœtica in Cornwall, 91
Lycæna orbitulus, Prun., L., var. *oberthur*, Stgr., and *L. pyrenaica*, B., 241
- Melanic *Aspilates gilvaria*, 61
 Method of Oviposition by *Cordulegaster annulatus*, 310
 Migration of Lepidoptera, 213, 237
 Monk's Wood and *Thecla pruni*, 22
Mutilla europæa, 283
- Neuroptera collected by Dr. T. A. Chapman in France and Spain, 296
- New and Little-known American Bees, 145
 New Australian Bees in the Collection of the British Museum, 270, 302
 New Australian Bees of the Genus *Nomia*, 217
 New Culicidæ from the West Coast of Africa, 101, 154
 New Species of Hymenoptera (Aculeata, Ichneumonidæ, and Braconidæ) from India, 83, 105
 New Work on British Butterflies, 312
 Noctua at Hartlepool, 282
 Note on Second Emergences, 259
 Note on Haworth's Type-specimen of "*Noctua subfusca*," 161
 Notes from Australia, 186; Essex, 260; the Chester District for 1904, 163, 187; Surrey, 239; on *Agrotis puta*, 135; on Coleoptera in South-west Surrey, 26, 93; on Larva of *Nyssia lapponaria*, and *Orgyia antiqua*, 237; on Lepidoptera in 1904, 125; on *Odonata*, 91; on Some Stephensian types of Tortricina in the National Collection, 98; on the Wave Moths (Genus *Acidalia*), 6, 48; on the Season 1905, 258; on *Tortrix podana*, 135; on *Zanclognatha grisealis*, 185
 Notodonta dromedarius (Second Brood) at Reading, 280
- OBITUARY :—
 Barrett, Charles Golding, 32
 Beaumont, Alfred, 120
 Packard, Alpheus Spring, 143
 Batley, A. U., 144
 Johnson, W., 240
 Quail, Ambrose, 264
 Douglas, John William, 264
 Warne, Norman Dalziel, 288
 Odonata in Herts, 1905, 314
 On a Small Collection of Anthophorid Bees from Colorado, 58
 On Late Broods of Lepidoptera, 280
 On the dark form of *Ischnura elegans* (female), 298
 Orthoptera in 1904, 266
 Ova of Butterflies wanted, 185
- Papilio steinbachii*, 125
 Parage achine on the Mendel, 60; megera, 282
 Partial Second Brood of *Pseudoterpnabajularia*, 259; of *Spilosoma menthastri*, 311
Phalonia (*Argyrolepis*) *badiana*, Hb., 213, 275, 309
Phtheochroa (*Commophila*) *rugosana* in Surrey, 214, 239
Plusia bractæa in Selkirk, 238
Plusia moneta in Lewisham, 260; (Second Brood) at Reading, 281
 Preoccupied Names in Coleoptera, 104

- Preponderance of Females in Autumnal Broods, 280
 Prolonged Pupal Stage of *Emmelesia unifasciata*, 310
 Pupation of *Catoclysta lemnata*, 90; of *Smerinthus tiliae*, 258
Pygæra pigra in Surrey, 27, 62

RECENT LITERATURE:—

- Catalogue of Lepidoptera, by F. Lowe, 31
 New Dragonfly Nymphs in the United States National Museum, by J. G. Needham, 71
 The Labium of the Odonata, by Hortense Butler, 71
 The Skewness of the Thorax in the Odonata, by J. G. Needham and Maude H. Anthony, 71
 The Phasmidæ or Walking-sticks of the United States, by A. N. Caudell, 71
 An Orthopterous Leaf-roller, 7
 Oviposition and Carnivorous Habits of the Meadow Green Grasshopper, by J. L. Hancock, 72
 The Leaf-hopper of the Sugar-cane, by R. C. L. Perkins, 72
 Suppression and Control of the Plague of Buffalo Gnats in the Valley of the Lower Mississippi River, by F. M. Webster, 72
 The Common Mosquitoes of New Jersey, by John B. Smith, 72.
 Who's Who?, 72
 Analytische Uebersicht der paläarktischen Lepidopterenfamilien, by C. V. Hormuzaki, 72
 Ants and some other Insects, by Dr. August Forel, 72
 A Treatise on the Acarina or Mites, by Nathan Banks, 72
 Entomologisches Jahrbuch, by Oskar Krancher, 72
 The Mosquitoes or Culicidæ of New York State, by G. P. Felt, 140
 Report on the Mosquitoes occurring within the State of New Jersey, their Habits, Life-history, &c., by John B. Smith, 141
 A Monograph of the Anopheles Mosquitoes of India, by S. P. James, 141
 Twenty-eighth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society, 142
 Entomologen Adressbuch, 143
 Proceedings of the South London Entomological and Natural History Society for 1904-5, 192
 A Catalogue of the Erycinidæ, by Levi W. Mengel, 262
 A Catalogue of the Lepidoptera of Northumberland, Durham, and

- Newcastle-upon-Tyne, by John E. Robson, 263
 The Insects of Jethou, the Insects of Herm, and the Fauna and Flora of the Sarnian Islands, 263
 Transactions of the Hertfordshire Natural History Society and Field Club, 263
 Transactions of the City of London Entomological and Natural History Society for the year 1904, 263
 Report of the Work of the Experiment Station of the Hawaiian Sugar Planters' Association, by R. C. L. Perkins, 288

REPORTS OF SOCIETIES:—

- Birmingham Entomological, 69, 168, 192, 216
 City of London Entomological and Natural History, 261, 319
 Entomological Club, 140, 162
 Entomological of London, 27, 67, 94, 116, 138, 165, 189, 284, 316
 Hawaiian Entomological, 120
 Lancashire and Cheshire Entomological, 31, 68, 96, 119, 166, 191, 286
 Manchester Entomological, 70, 167
 South London Entomological and Natural History, 29, 68, 95, 117, 140, 165, 190, 216, 260, 285, 318
 Rhopalocera at Barcelona, Montserrat, and Vernet-les-Bains, 250, 277, 299
 Rhopalocera palæarctica, 282
 Season of 1904, 63
 Second Broods of Lepidoptera, 260, 281
 Selenia lunaria in the Lancaster District, 186
 Sirex gigas at Chichester, 314; juvenis in Edinburgh, 283
 Some Australian Halictine Bees in the British Museum, 33
 Some Tasmanian Case-bearing Lepidoptera, 11
 Species of *Plusia* visit flowers of *Stachys*, 25
 Sphinx (*Agrius*) *convolvuli* in Hampshire, 24; *convolvuli* at Bournemouth, 260; in South-west London, 314
 Stray Notes on Aculeates, 149
 Supplementary List of the Lepidoptera of the Island of Capri, 82
 Synaposematic Hymenoptera and Diptera, 117
 Teratological Specimen of *Hybernia defoliaria*, 22
 The Day Collection, 238
 The Earlier Stages of *Catoclysta lemnata*, L., 1, 38
 The Entomological Club, 61, 213
 The Entomological Collections of the Oxford University Museum, 23

- The Habits of Asilidæ, 236
 The Lepidoptera of Berlin, 200, 226
 The Mason Collection, 112, 136, 162
 The Name Aldrichia, 236
 The National Collection of British Lepidoptera, 61, 213
 The Noctuid Genus *Ala*, 23
 The Rose Scale, 309
 The Time of Appearance of Lepidoptera in conjunction with Season and Latitude, 90
 Tortrices in the Liverpool District, 115
 Unusual Dates, 92
Vanessa antiopa in Middlesex, 283; in Norfolk, 283; in Suffolk, 283; in Surrey, 91
 VARIETIES :—
 Abraxas grossulariata, 119
 Acidalia aversata, 163; *inornata*, 29
 Acronycta leporina, 289
 Aglais urticæ, 285
 Anthrocera filipendulæ, 29
 Aplecta nebulosa, 187
 Aporophyla australis, 30
 Arctia caia, 117, 136
 Argynnis aglaia, 29, 114; *euphrosyne*, 114; *paphia*, 114; *selene*, 114
 Aspilates gilvaria, 61
 Boarmia gemmaria, 286; *repandata*, 163; *rhomboidaria*, 163
 Biston hirtaria, 189
 Callimorpha dominula, 136
 Calymnia trapezina, 29
 Chrysophanus phlœas, 114, 320
 Cleora glabraria, 30, 286
 Cœnonympha pamphilus, 319
 Colias edusa, 29; *hyale*, 29
 Cupido minima, 286
 Dianthœcia capsicola, 29
 Epinephele ianira, 29, 114; *tithonus*, 114
 Euchelia jacobææ, 185, 216
 Euchloë cardamines, 114
 Eupithecia rectangulata, 239
 Euthemonia russula, 30
 Forficula auricularia, 317
 Heleconius silvana, 317
 Lachneis lanestris, 29
 Lycæna corydon, 262
 Melitæa athalia, 27; *cinxia*, 30
 Nemeobius lucina, 114
 Ortholitha plumbaria, 204
 Polyommatus corydon, 286
 Pyrameis atalanta, 29
 Sarrothripus revayana, 114
 Saturnia pavonia, 28
 Satyrus semele, 114
 Spilosoma menthastri, 30, 136, 311
 Syrichthus malvæ, 28
 Zonosoma pendularia, 29
 Wasps with Butterfly, 282
 Western Smerinthids, 111
Xylina semibrunnea in Reigate, 314

INSTRUCTIONS to BINDER.—The SPECIAL INDEX, given with the 'Entomologist' for January, 1906, belongs to this Volume, and should be placed next to this General Index.

SPECIAL INDEX.

New Genera, Species, and Varieties are marked with an asterisk.

COLEOPTERA.

- ædilis* (*Acanthocinus*), 287
ænea (*Triplex*), 119
seruginosus (*Longitarsus*), 119
æthiops (*Pterostichus*), 26
Agathidium, 318
Alexia, 104
anale (*Sinoxylon*), 167
Anodon, 104
anthobia (*Amara*), 139
aquaticus (*Notiophilus*), 26
armata (*Strangalia*), 26
arvensis (*Spergula*), 286
arietis (*Clytus*), 93
Asenum, 192
atrata (*Silpha*), 93
atricapillus (*Bolitobius*), 93
aurata (*Cetonia*), 26
barnevillei (*Malachnis*), 95, 119
betulæ (*Omophlus*), 189
bicolor (*Triplax*), 119
bifasciatum (*Rhagium*), 168
biguttatus (*Notiophilus*), 26
bimaculatus (*Hister*), 27
**biplagiata* (*Prosopocera*), 75
bipustulatus (*Agabus*), 93
bipustulatus (*Sphæridium*), 93
bipunctata (*Coccinella*), 27
bissexstriatus (*Hister*), 137
blandus (*Otiorrhynchus*), 287
brevicollis (*Nebria*), 27
bruchoides (*Rhinoncus*), 286
burchelli (*Haplothorax*), 28
cacicus (*Goliathus*), 167
caligatus (*Pæderus*), 26
campestris (*Cicindela*), 26
caraboides (*Melandrya*), 69
cardinalis (*Vedalia*), 131
castaneum (*Tetropium*), 28
castaneus (*Medon*), 165
cerasi (*Orsodacna*), 287
cervus (*Lucanus*), 26
chalceus (*Pogonus*), 27
chlorocephala (*Lebia*), 165
chrysostigma (*Chrysobothris*), 167
clypealis (*Hydrovatus*), 161
clypeatus (*Telephorus*), 27
cærulea (*Edemera*), 27
coriarius (*Prionus*), 26
consanguinea (*Homalota*), 137
contractus (*Ceuthorrhynchus*), 284
Coryphus, 104
crassipes (*Atherix*), 27
cynocephala (*Lebia*), 165
cynoglossi (*Dibolia*), 287
discolor (*Donacia*), 287
**distanti* (*Ophryodera*), 97
distinguenda (*Melanopthalma*), 284
druryi (*Goliathus*), 167
dytiscoides (*Platydemus*), 168
Eriocephalus, 192
erythrocephalus (*Neoclytus*), 138, 166
exigua (*Oxypoda*), 116
**exitiosus* (*Oxycaenus*), 169
familiaris (*Amara*), 27, 139
femorata (*Oncomera*), 93
ferrea (*Stenostola*), 69
fimetarius (*Aphodius*), 26
flavipes (*Cercyon*), 93
fossor (*Clivina*), 27
foveolatus (*Claviger*), 93
fowleri (*Dacne*), 318
fraxini (*Hylesinus*), 167
fuliginosus (*Ilybius*), 93
fulgidus (*Xantholinus*), 26
fulva (*Armara*), 27
gentilei (*Anophthalmus*), 287
gibbus (*Zabrus*), 93
giganteus (*Goliathus*), 167
giganteus (*Titanus*), 30
gracilipes (*Anchomenus*), 119
granaria (*Oligota*), 94
grandis (*Anthonomus*), 131
graniceps (*Phycocetus*), 285
granulatus (*Carabus*), 26
hæmorrhoidalis (*Athous*), 27
hagensi (*Dinarda*), 287
hermanni (*Pelobius*), 161
hieroglyphica (*Coccinella*), 137
horticola (*Phyllopertha*), 26
humator (*Necrophorus*), 26
humeralis (*Dacne*), 318
intricatus (*Carabus*), 93
insularis (*Stenus*), 284
**jordani* (*Plectrogaster*), 76
lævigata (*Timarcha*), 26
lævigatum (*Apion*), 316

- *lanei* (Zographus), 74
latus (Deronectes), 161
linearis (Cossonus), 27
longicornis (Quedius), 287
lucida (Amara), 27, 139
lunatus (Callistus), 93
luridipennis (Psylliodes), 284, 287
lutosus (Bagous), 119
madidus (Pterostichus), 26
mandibularis (Acrognathus), 189
marginata (Stenellina), 104
marginalis (Dytiscus), 93, 166
marginatus (Malthodes), 26
maurus (Otiorrhynchus), 287
maxillosus (Creophilus), 26
melipoma (Megalopus), 139
meridianus (Toxotus), 93
minuta (Myllæna), 137
monilis (Carabus), 26
monilis (Læmophilus), 318
mortuorum (Necrophorus), 26
moschata (Aromia), 26
mucronata (Blaps), 26
natator (Gyrinus), 93
navale (Lymexylon), 284
nigriceps (Cercyon), 137
nigrina (Oxypoda), 116
nigrita (Pterostichus), 93
nigrocæruleus (Quedius), 28, 119
nobilis (Gnorumus), 189
noctiluca (Lampyrus), 27
obliquus (Halipus), 93
ocellata (Coccinella), 27
ocellarus (Dinoderus), 165
olens (Ocypus), 26
orichalcia (Chrysomela), 69
ossium (Stenus), 284
ovatus (Hyphydrus), 93
palustris (Hydroporus), 93
palustris (Notiophilus), 93
pallipes (Ceuthorrhynchus), 284
paradoxus (Metæus), 69
parallelipedus (Dorcus), 26
parumpunctatus (Anchomenus), 287
pectinicornis (Plectrogaster), 76
pectoralis (Anoplognathus), 186
pertinax (Anobium), 93
peruviana (Dermestes), 119
piceus (Hydrophilus), 287
pini (Bruchus), 69
polita (Chrysomela), 93
pomonæ (Apion), 93
potentillæ (Sibinia), 286
primita (Sibinia), 286
proscarabæus (Meloë), 93, 166
pubescens (Leptura), 167
pumilio (Placusa), 137
pusillus (Adrastus), 287
quadripustulatum (Bembidium), 119
reppensis (Hyperaspis), 287
rostratus (Cychrus), 26
**rothschildi* (Prosopocera), 98
rufifrons (Dacne), 318
rufimanus (Bruchus), 69
rufocincta (Amara), 69
rugosa (Silpha), 93
rusica (Triplax), 119
sabulicola (Harpalus), 137
sagax (Spilonotella), 104
sagax (Spilonota), 104
sanguinolenta (Chrysomela), 287
sericea (Oxypoda), 116
sepicola (Tropideres), 68
septempunctata (Coccinella), 27
sericatus (Catops), 137
sericornis (Prionocyphon), 318
solstitialis (Rhizotrogus), 26
sparsus (Orchestes), 27
Sphondylia, 104
spinibarbis (Leistus), 93
Stenella, 104
stephensi (Illaphanus), 285
stercorarius (Geotrupes), 26
strenuus (Pterostichus), 93
striata (Helops), 116
striatus (Helops), 118, 167
striola (Pterostichus), 26
sulcatum (Aulonium), 119
sulcatus (Acilius), 93
sulcipennis (Phycotus), 285
sutor (Monohammus), 287
suturalis (Cordylomera), 284, 320
suturalis (Lochmæa), 189
sycophana (Calosoma), 118
sylvaticus (Geotrupes), 93
tardus (Pelobius), 93
tectus (Ptinus), 287
tessellatum (Xestobium), 27
typhæus (Geotrupes), 26
variabilis (Coccinella), 27
vernalis (Geotrupes), 26
versicolor (Pterostichus), 26
villosus (Balaninus), 26
violaceus (Carabus), 26
violaceus (Meloë), 93
violaceum (Callidium), 168
virescens (Ædemera), 119
vulgaris (Melolontha), 26
vulgaris (Pterostichus), 26

DIPTERA.

- abdominalis (*Ospriocerus*), 236
 *alboannulatus (*Edimorphus*), 154
 alboannulata (*Anisocheleomyia*), 54
 albolineata (*Danielsia*), 104
 ampelophila (*Drosophila*), 198
 *Anisocheleomyia, 52
 *austeni (*Pyretophorus*), 102
 bellus (*Tanypus*), 236
 carnaria (*Sarcophaga*), 150
 choreus (*Tanypus*), 236
 cornicina (*Lucilia*), 152
 creticus (*Culex*), 158
 cynipsea (*Sepsis*), 152
 devius (*Micrododon*), 284
 fallax (*Cynorrhina*), 284
 fasciata (*Stegomyia*), 225
 fatigans (*Culex*), 158
 ferruginea (*Hammerschmidtia*), 284
 fusca (*Gossina*), 288
 Heptaphlebomyia, 156
 hirsutipalpis (*Culex*), 156
 inquinatus (*Stenopogon*), 236
 latifrons (*Micrododon*), 284
 modestus (*Chironomus*), 236
 monilis (*Tanypus*), 236
 nigripes (*Anopheles*), 102
 nigrita (*Ptilops*), 168
 *nivipes (*Anisocheleomyia*), 52
 palpalis (*Glossina*), 288
 paludosa (*Tipula*), 282
 pilipes (*Hydrotea*), 116
 pygmæa (*Uranotænia*), 54
 rusticus (*Machimus*), 95
 scævoides (*Chamæsyphus*), 284
 sexpunctata (*Psychoda*), 165
 simplex (*Heptaphlebomyia*), 157
 *simpsoni (*Stegomyia*), 224
 *smithii (*Anopheles*), 101
 splendida (*Lonchæa*), 198
 talpæ (*Hystrihopsylla*), 165
 tenuis (*Tanytarsus*), 236
 tuberculata (*Hydrotea*), 116
 Uranotænia, 52
 *wellmanii (*Danielsia*), 103
 xanthodes (*Tephrites*), 198

HEMIPTERA.

- Acanthia, 110
 æneus (*Eysarcoris*), 286
 Aphelocheirus, 173
 auratus (*Ellampus*), 120
 australis (*Antonina*), 256
 australis (*Hydrometra*), 256
 avenæ (*Siphocoryne*), 132
 brevipennis (*Nabis*), 285
 Callidea, 78
 Calliphora, 78
 campestris (*Liburnia*), 130
 canalium (*Gerris*), 177
 Cephalocleus, 79
 cerealis (*Macrosiphum*), 132
 Cimex, 110, 304
 cimicoides (*Ilyocoris*), 173, 177, 178
 cimicoides (*Naucoris*), 174, 177
 cimicoides (*Nepa*), 174
 Clinocoris, 77, 110
 corticalis (*Phylloxera*), 197
 Corythuca, 195
 costæ (*Gerris*), 177
 crassipes (*Berytus*), 318
 Daktulosphaira, 79
 divinator (*Perithous*), 120
 divisa (*Dryophanta*), 120
 Embolophora, 79
 fecundatrix (*Andrieus*), 120
 femorata (*Pelocoris*), 174
 festuca (*Eriopeltis*), 285
 fragariella (*Siphonophora*), 309
 fragariellum (*Macrosiphum*), 309
 fluminea (*Belostoma*), 175
 geoffroyi (*Corixia*), 232
 gibbifera (*Gerris*), 177
 glauca (*Notonecta*), 177
 Gonianotus, 79
 granaria (*Macrosiphum*), 132
 *greeni (*Aneurus*), 194
 hesperideana (*Leucanium*), 31
 hieroglyphica (*Arctocoris*), 232
 histrionica (*Murgantia*), 130
 indica (*Amorgius*), 175
 Klinophilos, 76
 lantanæ (*Cerataphis*), 196, 198
 lateralis (*Arctocoris*), 232
 lateralis (*Gerris*), 177
 lacustris (*Gerris*), 177
 lacustris (*Pygolampis*), 174
 Leucaniodiaspis, 78
 Leucanodiaspis, 78
 lectularius (*Cimex*), 77, 110
 Legnotus, 79
 lemana (*Sigara*), 235
 lenticularis (*Neuroterus*), 120
 lethifer (*Pemphredon*), 120
 limbatus (*Nabis*), 281
 lineata (*Hydrometra*), 255
 lutea (*Notonecta*), 132
 lutulenta (*Liburnia*), 130
 Macrocephalus, 79
 maculata (*Naucoris*), 178
 mali (*Aphis*), 132
 Macrothyreus, 79
 martini (*Hydrometra*), 256
 melanocephalus (*Eysarcoris*), 286
 mercenaria (*Arctocoris*), 232, 233
 meridionalis (*Sigara*), 235

minuta (Sigara), 235
 minutissima (Micronecta), 235
 montandoni (Aphelocheirus), 178
 naias (Gerris), 177
 Naucorinus 79, 309
 naucoris (Nepa), 174
 nigrolineata (Arctocoris), 232
 odontogaster (Gerris), 177
 Odontopus, 79
 pe-la (Ericerus), 128
 perniciosus (Aspidiotus), 130
 Philia, 78
 Phlæophthiridium, 79
 pilicornis (Drymus), 318
 poweri (Sigara), 235
 Probergrothius, 79
 pruni (Coccus), 78

pygmæa (Microvelia), 173
 Rhizophthiridium, 79
 rosæ (Aulacaspis), 309
 rufoscutellata (Gerris), 177
 saccharicaulis (Aspidiotus), 78
 salicis (Chionaspis), 256
 schillingii (Chorosoma), 261
 Schiœdttia, 79
 scholtzii (Micronecta), 235
 senator (Schiœdttia), 79
 septendecim (Tibicen), 130
 striata (Coriza), 232
 sylvestris (Drymus), 318
 thoracica (Gerris), 177
 trifolii (Macrosiphum), 132
 *vestita (Græana), 121
 viridis (Tetigonia), 198

HYMENOPTERA.

abdominalis (Corynura), 34
 *Acanthoprymnus, 249
 ænea (Nomia), 222
 æruginosus (Agapostemon), 34
 agilis (Corynura), 35
 agilis (Melissodes), 145
 agrorum (Bombus), 151
 alternata (Nomada), 152
 *annulicornis (Spilichneumon), 85
 *apicate (Anomalon), 106
 arbanus (Halictus), 272
 ardens (Crabro), 16
 argentatus (Crabro), 15
 argentifrons (Nomia), 220
 arvensis (Mellinus), 151, 152
 aspasia (Augochlora), 37
 aspasia (Halictus), 37
 assamensis (Cerceris), 269
 australica (Nomia), 221
 austrovagans (Nomia), 218
 barbara (Atta), 96
 belfragei (Synhalonia), 147
 bellus (Crabro), 15
 biangulatus (Halictus), 272, 302, 303
 bicolor (Gonotopus), 130
 bituberculata (Megaloptera), 35
 bomboides (Anthophora), 35
 briseis (Augochlora), 35
 briseis (Corynura), 35
 calliope (Megaloptera), 36
 cephalotes (Ecodoma), 96
 Chartergus, 22
 Chloralictus, 37
 cnici (Melissodes), 146
 *Cœnostoma, 171
 *coxalis (Spilichneumon), 105
 cuprifrons (Megaloptera), 36
 *dampieri (Halictus), 270
 dentiventris (Melissodes), 146
 dentiventris (Nomia), 221
 dilecta (Synhalonia), 148
 *Dinocryptus, 170
 discolor (Corynura), 34

*doddii (Nomia), 222
 *Echthrus, 171
 edwardsii (Synhalonia), 147
 elegans (Nomia), 223
 *elizeus (Iphiaulax), 107
 elongata (Cœlioxyis), 68
 *elvinus (Crabro), 14
 *erythrozonus (Craticheumon), 105
 euops (Anthophora), 58, 60
 europæa (Mutilla), 283
 *excavatus (Cryptus), 84
 familiaris (Halictus), 304
 fasciatus (Hemiteles), 317
 festivaga (Augochlora), 37
 filicornis (Cœnostoma), 172
 flava (Formica), 93
 flavoplagiata (Crabro), 16
 flavoviridis (Nomia), 222
 flindersi (Halictus), 271
 floralis (Halictus), 271
 floris (Melissodes), 145
 frater (Synhalonia), 147
 furcata (Schizocera), 216
 fusca (Formica), 96
 generosa (Nomia), 217
 germanica (Vespa), 149
 gibbus (Pompilus), 151
 *gilesi (Halictus), 273, 302
 gillettei (Synhalonia), 148
 globosus (Halictus), 303, 304
 gohrmana (Anthophora), 59, 60
 hero (Pompilus), 17
 himalayensis (Cerceris), 84, 269
 hirsutus (Tachytes), 153
 *Holcalysia, 268
 Hoplonomia, 218
 *humei (Halictus), 273, 302, 303
 *hypodonta (Nomia), 220
 *Icuma, 21
 idalia (Megaloptera), 36
 inclinans (Halictus), 272
 incognitus (Pompilus), 17
 janthina (Megaloptera), 36

- johnsoni (Emphoropsis), 58
 jucunda (Corynura), 34
 kollari (Cynips), 27
 lætatorius (Bassus), 224
 lanuginosus (Halictus), 273, 302, 304
 lapidarius (Bombus), 151
 *lauta (Perdita), 145
 *lepidota (Nomia), 218
 limatus (Halictus), 272
 *lissocephalus (Gasteruption), 227
 livida (Tenthredo), 216
 *luculentus (Cryptus), 85
 *lutea (Phalega), 170
 lysias (Crabro), 15
 mandarina (Vespa), 167
 marginalis (Corynura), 34
 mentzelie (Perdita), 145
 mentzeliarum (Perdita), 145
 *menyllus (Crabro), 15
 metallica (Nomia), 269
 minutula (Andrena), 152
 mœrens (Nomia), 217
 montana (Anthophora), 58, 60
 moricei (Panurgus), 317
 murrayi (Halictus), 272
 mucida (Emphoropsis), 58, 59
 mysops (Melissodes), 146
 nana (Augochlora), 37
 nanus (Halictus), 37
 nasidens (Odynerus), 21
 nasutus (Agapostemon), 34
 *natalensis (Pseudagenia), 223
 neomexicana (Anthophora), 58
 *niger (Dinocryptus), 171
 niger (Lasius), 96
 nigrofemorata (Megaloptera), 36
 norvegica (Vespa), 149
 Nyxeophilus, 171
 odontophorus (Crabro), 16
 opulenta (Nomia), 223
 orbatus (Halictus), 303
 ornata (Megalopta), 35, 36
 *orodes (Anoplius), 17
 *oxleyi (Halictus), 272, 302, 303
 pallidior (Perdita), 45
 pedestrius (Pompilus), 17
 *Phalega, 170
 pilosa (Megaloptera), 36
 Plesiozethus, 269
 porterae (Anthophora), 58, 60
 posticus (Odynerus), 153
 pseudobaccha (Corynura), 34
 Psithyrus, 151
 pulchribalteata (Nomia), 218
 punjabensis (Iphiaulax), 107
 purpurata (Megaloptera), 35
 reginae (Nomia), 221
 representans (Halictus), 273, 302, 304
 *reticulatus (Diodonatus), 83
 rhopalocera (Agapostemon), 34
 *roseoviridis (Paracolletes), 270
 rothneyi (Pompilus), 17
 rubicundus (Halictus), 152
 *rubroviridis (Nomia), 223
 rufa (Formica), 96, 168
 rufa (Vespa), 149
 ruficornis (Nomia), 217
 *rufocognata (Nomia), 219
 ruginodis (Myrmica), 96
 sanguinea (Formica), 96, 256
 *semipallida (Nomia), 220
 *sericea (Icuma), 21
 sicheli (Agapostemon), 34
 silvaensis (Odynerus), 153
 *simlensis (Cerceris), 83
 *smenus (Iphiaulax), 107
 smithella (Nomia), 217
 speciosa (Synhalonia), 148
 striolatus (Diodonatus), 83
 *subagilis (Melissodes), 145
 sulphurea (Crabro), 16
 sylvestris (Vespa), 149
 tenuihirta (Nomia), 219
 terrestris (Bombus), 151
 *territella (Synhalonia), 146
 *testaceipes (Holcalysia), 269
 titania (Angiochlora), 35
 Torbda, 171
 transvaalensis (Tachytes), 153
 trimmerana (Andrena), 152
 tristis (Anasa), 255, 256
 tristis (Crabro), 16
 trutta (Synhalonia), 147
 vaalensis (Odynerus), 153
 *violaceipennis (Acanthoprymnus), 250
 vischnu (Pompilus), 17
 vivax (Megaloptera), 36
 vivax (Pompilus), 17
 vulgaris (Vespa), 149, 151
 willeyi (Nomia), 269
 wilkella (Andrena), 151
 Zethoides, 269
 zonata (Anthophora), 223

LEPIDOPTERA.

- abbreviata (Eupithecia), 184
 abbreviata (Tephroclystia), 184
 abietaria (Boarmia), 216, 318
 abietella (Dioryctria), 82
 abruptaria (Hemerophila), 29, 65, 67, 182
 abscondita (Acronycta), 205, 208
 acaciæ (Thecla), 52, 244, 274
 acauda (Papilio), 140
 Acentropus, 1, 2
 aceriana (Gypsonoma), 218
 aceriana (Hedya), 281
 aceris (Acronycta), 64, 65, 66, 257, 319
 achillæ (Zygæna), 210
 achinoides (Pararge), 124
 achine (Pararge), 60, 124, 275
 Acidalia, 6, 8, 9, 47

- acis (Lycæna), 113
 acroleuca (Lymnas), 230
 actæa (Satyrus), 275
 actæon (Adopæa), 209, 275
 actæon (Hesperia), 315
 adæquata (Larentia), 202
 adelopsis (Xysmatodoma), 13
 adippe (Argynnis), 87, 274, 295
 admetus (Lycæna), 52
 adonis (Lycæna), 63
 adonis (Morpho), 139, 226
 adrasta (Pararge), 274, 300
 adusta (Hadena), 205
 adusta (Pararge), 279
 adustata (Ligdia), 94
 advenaria (Epione), 203, 261, 315
 advena (Aplecta), 69, 168
 advena (Mamestra), 205, 208
 ægeria (Pararge), 278
 ægon (Lycæna), 52, 88, 93, 226, 301, 315
 æmulana (Catoptria), 115
 æscularia (Anisopteryx), 183
 æsculi (Thecla), 251, 274, 301
 æthiops (Erebia), 30, 87, 226, 286
 affinis (Calyptia), 66
 affinis (Danais), 86
 affinitata (Emmelesia), 94, 183, 292
 agathina (Agrotis), 70, 287
 agestis (Lycæna), 87, 88, 92, 123, 207,
 209, 274, 294, 315
 aglaia (Argynnis), 29
 agrippina (Thysania), 231
 Ala, 23
 albicillata (Melanthia), 184, 204, 292
 albicolon (Mamestra), 80, 205, 207
 albimacula (Dianthecia), 216
 albipuncta (Leu.), 207, 208, 227, 287, 319
 albitarsella (Coleophora), 285
 albulata (Emmelesia), 183
 alchemillata (Em.), 63, 64, 92, 93, 94, 183
 alcææ (Carcharodus), 274, 301
 alcon (Lycæna), 207, 273, 274
 alciphron (Chrysoph.), 206, 274, 300, 301
 alcyone (Satyrus), 209, 226, 244, 274, 301
 alcyonipennella (Coleophora), 285
 alecto (Erebia), 139, 275
 alexanor (Papilio), 49, 274
 algæ (Bryophila), 208
 aliena (Mamestra), 205, 208
 allionia (Satyrus), 51, 274
 alniaria (Ennomos), 65, 181
 alternata (Conchylis), 127
 alternata (Macaria), 227
 alternata (Semiiothisa), 204
 althææ (Carcharodus), 245, 274
 alveus (Hesperia), 207, 245, 274, 301
 amanda (Lycæna), 206, 211
 amandus (Lycæna), 207, 245, 274, 301
 amata (Timandra), 8, 204
 ambigua (Caradrina), 209, 227
 ambrosa (Chloridea), 258
 americanus (Papilio), 229
 amurensis (Chrysophanus), 124
 amurensis (Leptidia), 123
 anachoreta (Pygæra), 70
 anargyra (Argynnis), 50
 andreniformis (Sesia), 114
 andromache (Acraea), 186
 angularia (Ennomos), 67, 181, 227
 angustana (Eupocilia), 116
 angustea (Scoparia), 137
 Ania, 8
 anomala (Stilbia), 163
 antiopa (Vanessa), 70, 91, 112, 212, 227,
 229, 274, 283
 antiqua (Orgyia), 108, 237
 apiciaria (Epione), 93, 181
 apollo (Parnassius), 246, 248, 274, 300
 aprilina (Agriopis), 160
 aprilina (Dichonia), 227
 aquilina (Agrotis), 80, 134
 arbuti (Heliodes), 93
 arbuti (Heliaceae), 180
 arcania (Cœnonympha), 51, 207, 209,
 253, 274, 278, 279, 301
 arcuosa (Miana), 287
 arete (Epinephele), 95, 319
 archippus (Danais), 186
 areola (Xylocampa), 65, 160
 arethusa (Satyrus), 274
 argentea (Cucullia), 201
 argentina (Spatalia), 207
 argentula (Bankia), 207
 argiades (Lycæna), 52, 245, 274, 301
 argillacea (Aletia), 131
 argiolus (Cyaniris), 52, 82, 90, 191, 203,
 227, 244, 262, 274, 286, 301
 argiolus (Lyc.), 63, 90, 185, 251, 259, 315
 argus (Lyc.), 52, 93, 211, 226, 253, 279, 301
 argyrognomon (Lycæna), 124, 274, 284
 arion (Lyc.), 113, 193, 209, 240, 274
 aristæus (Satyrus), 51
 armigera (Heliothis), 93, 258
 artemisiæ (Cucullia), 201
 artemisiella (Coleophora), 260
 arundinis (Nonagria), 64, 133, 294
 asellaria (Acidalia), 18
 asellaria (Psychopoda), 46
 asclepius (Papilio), 228
 ashworthii (Agrotis), 30, 61, 165, 287
 aspersana (Peronea), 115
 associata (Cidaria), 199, 212
 asteris (Cucullia), 260, 291
 Asthena, 6
 astrarche (Lycæna), 52, 93, 207, 251,
 252, 274, 279, 301
 atalanta (Pyrameis), 25, 29, 30, 62, 87,
 117, 229, 253, 259, 274, 294, 301, 309
 atalanta (Vanessa), 163
 atergatis (Lycorea), 230
 athalia (Melitea), 27, 73, 207, 209, 251,
 253, 274, 278, 279, 301
 atlantis (Ageronia), 229
 atomaria (Ematurga), 182
 atraria (Aspilates), 214
 atrata (Odezia), 212
 atrata (Tanagra), 199, 292
 atriplicis (Hadena), 287

- atriplicis (Trachea), 206, 208
 atropos (Acherontia), 88, 113, 260, 283
 atropos (Manduca), 113
 augur (Noctua), 134
 aurago (Xanthia), 65, 66
 aurantiaria (Hybernia), 25, 183
 auratus (Chrysophanus), 124
 aureola (Lithosia), 205
 aurelia (Melitæa), 207, 209
 auricoma (Acronycta), 206, 208, 227
 auriflua (Euproctis), 211
 auriflua (Liparis), 292
 auriflua (Porthesia), 259
 aurinia (Melitæa), 50, 206, 251, 252, 263, 275, 295, 317
 aurora (Colias), 123
 auroraria (Hyria), 199, 315
 ausonia (Euchloë), 251, 274
 australis (Aporophila), 30, 93
 australis (Doleschalia), 187
 autumnaria (Ennomos), 227
 aversata (Acidalia), 67, 163, 200, 292, 319
 aversata (Ptychopoda), 10
 badiana (Argyrolepis), 213, 275
 badiana (Phalonia), 213, 275, 309
 badiata (Anticlea), 184
 badiella (Depressaria), 127
 badiipennella (Coleophora), 285
 baja (Noctua), 93, 134, 208, 227, 292
 bajularia (Pseudoterpna), 259, 315
 baltica (Hadena), 205
 banksiella (Anerastia), 287
 barbalis (Pechipogon), 204
 basilinea (Apamea), 66
 basilinea (Hadena), 207
 batis (Thyatira), 93, 109, 315
 baton (Lycæna), 274
 belgiaria (Scodionia), 182
 belia (Euchloë), 49, 251, 274
 bellargus (Lyc.), 253, 274, 279, 301, 319
 bellezina (Euchloë), 274
 bellidice (Pieris), 49
 bembeciformis (Troch.), 126, 167
 bergmanniana (Dictyopteryx), 115
 berolinensis (Zygæna), 210
 betulæ (Salebria), 293
 betulæ (Zephyrus), 88, 275
 betularia (Amphidasys), 30, 67, 115, 116, 181, 187, 188
 bianor (Papilio), 122
 biarcuana (Ancyliis), 164
 bicolor (Leucodonta), 136
 bicolorana (Hylöphila), 92, 207
 bicolorata (Melanthia), 184, 292
 bicoloria (Miana), 208
 bicostella (Pleurota), 164
 bicuspis (Cerura), 136, 186, 201
 bidentata (Odont.), 65, 181, 188, 261, 287
 bifasciata (Perizoma), 310
 bifida (Cerura), 66, 109
 bifida (Dicranura), 63
 bilineata (Camptogramma), 18, 184, 292
 bilineata (Larentia), 18
 bilunaria (Pædisca), 116
 bilunaria (Selenia), 181
 binaria (Drepana), 204, 314
 bipunctaria (Eubolia), 30, 210, 283
 bipunctaria (Ortholitha), 210
 bipunctidactyla (Mimæa), 164
 bipunctidactyla (Stenoptilia), 20
 bisetata (Acidalia), 81, 93, 199, 209, 292
 biundularia (Tephrosia), 182
 blanda (Caradrina), 93
 blumei (Papilio), 118
 Boarmia, 7
 boetica (Lycæna), 91, 92
 boeticus (Lampides), 245, 273, 274
 bombylifomis (Hemaris), 89, 206
 bombylifomis (Macroglossa), 295
 boreata (Cheimatobia), 25, 183
 bractea (Plusia), 26, 238
 brassicæ (Pieris), 25, 238, 259, 274, 300
 brassicæ (Mamestra), 65, 66, 292
 briseis (Satyrus), 244, 274
 brooksiana (Prepona), 254
 brumata (Cheimatobia), 96, 183, 192
 brunnea (Noctua), 66, 134
 brunneata (Halia), 202
 bucephala (Phalera), 65, 109, 204, 259
 buckleyana (Prepona), 255
 cacaliæ (Hesperia), 275
 cæcimacula (Ammocoenia), 227
 cæruleocephala (Diloba), 25, 40, 65
 cæsiata (Larentia), 183, 212
 cæsonia (Meganostoma), 216
 cæstrum (Hypopta), 82
 caia (Arctia), 29, 64, 89, 117, 164, 212
 c-album (Grapta), 211, 227
 c-album (Polygonia), 274, 279, 301
 c-album (Vanessa), 63
 calida (Lycæna), 52
 calidella (Ephestia), 19
 callidice (Pieris), 249, 274
 callidryas (Anæa), 230
 callunæ (Lasiocampa), 69
 cambricaria (Venusia), 7, 263
 camelina (Lophopteryx), 65, 109, 207, 262
 camilla (Limenitis), 253, 274, 279, 301
 candalarum (Agrotis), 205
 candidata (Asthenia), 6, 199
 candidulana (Catoptria), 260
 canescens (Polia), 82
 canigulensis (Melan.), 244, 274, 301, 317
 cantenerella (Bradyrrhoa), 19
 capaneus (Papilio), 187
 capsicola (Dianthæcia), 29
 capsophila (Dianthæcia), 94
 captiuncula (Phothedes), 134
 carbonariella (Phycis), 119
 cardamines (Euchloë), 63, 86, 114, 202, 274, 279, 295, 300, 319
 cardui (Pyrameis), 25, 87, 94, 212, 251, 262, 274, 287, 301
 cardui (Vanessa), 93, 163, 237, 282
 carniolica (Zygæna), 210
 carnus (Hepialus), 108, 163
 carpinata (Lobophora), 184
 carpinata (Larentia), 202

- carpini (Saturnia), 292
 carthami (Hesperia), 210, 274, 279, 301
 cassinea (Asteroscopus), 25
 cassiope (Erebia), 248, 274
 castigata (Eupithecia), 93, 183, 292
 castrensis (Malacosoma), 210
 caudana (Rhacodia), 285
 cecrops (Protophonus), 230
 celerio (Chærocampa), 88, 113
 celsia (Nænia), 227
 celtis (Libythea), 246, 275
 cembræ (Scoparia), 292
 cenea (Papilio), 28
 centaureata (Eupithecia), 93
 cerago (Xanthia), 159, 287
 ceriayi (Smerinthus), 111
 cerri (Thecla), 57
 cervinata (Eubolia), 199
 cespitis (Luperina), 63, 209, 314
 cespitis (Epineuronia), 227
 cespitana (Sericois), 115
 chærophyllata (Tanagra), 199, 292
 chalcytes (Plusia), 18
 chamomilla (Cucullia), 214, 287
 chaonia (Drymonia), 206
 charitonia (Heliconius), 229
 chenopodii (Hadena), 66
 chenopodii (Mamestra), 259
 chi (Polia), 30, 160, 292
 chlamitulalis (Nola), 82
 chlorana (Earias), 66
 chrysanthæana (Cnephassa), 99
 chrysanthemi (Zygæna), 114
 chryseis (Chrysophanus), 113
 chrysidiformis (Egeria), 261
 chrysidiformis (Sesia), 261
 chrysis (Plusia), 26, 66, 68, 180, 209, 238, 292, 314
 chrysippus (Limnas), 139
 chrysorrhæa (Euproctis), 211
 chrysorrhæa (Porthesia), 260
 cinctaria (Boarmia), 202
 cinerea (Agrotis), 63, 205
 cinxia (Melitæa), 30, 73, 206, 253, 275, 301
 circe (Satyrus), 51, 246
 citrigo (Xanthia), 64, 65, 227
 citraria (Aspilates), 18
 clara (Anæa), 230
 clathrata (Strenia), 8, 182, 202
 cleobis (Lycæna), 124
 cleodippe (Argynnis), 123
 cleopatra (Gonepteryx), 190, 246, 251, 253, 274
 clytie (Apatura), 207, 275
 c-nigrum (Agrotis), 208, 227
 c-nigrum (Noctua), 134
 cœnia (Junonia), 229
 cœnosa (Lælia), 136
 collina (Agrotis), 212
 comes (Triphana), 158
 comitata (Pelurga), 199, 259
 comma (Angiades), 203, 207, 274
 comma (Hesperia), 64
 comma (Leucania), 110, 208, 292
 comma (Urbicola), 312
 comma-notata (Cidaria), 93
 complana (Lithosia), 80, 208
 complanula (Lithosia), 292
 conflictella (Cebysa), 11
 conformis (Xylina), 160
 conigera (Leucania), 30, 65, 208, 293
 consonaria (Tephrosia), 165, 182, 204
 consortaria (Boarmia), 165, 206
 conspicillaris (Xylomyges), 82, 287
 constrictella (Eupithecia), 183
 contaminana (Teras), 115
 contigua (Hadena), 261, 291, 293
 contigua (Mamestra), 206, 208
 contiguaria (Acidalia), 287
 contiguaria (Ptychopoda), 48
 conversaria (Boarmia), 29
 convexella (Heterographis), 19
 convolvuli (Agrilus), 24, 29
 convolvuli (Sphinx), 24, 88, 138, 163, 168, 214, 260, 293, 314
 cordula (Satyrus), 275
 coretas (Lycæna), 52, 301
 coridon (Lycæna), 301
 corsica (Lycæna), 52
 corticana (Penthina), 115
 corticea (Agrotis), 161, 213
 coronata (Eupithecia), 202
 corydon (Lycæna), 88, 129, 201, 210, 251, 262, 274, 286
 corydon (Polycommatus), 30
 corylana (Tortrix), 115
 corylata (Cidaria), 185, 204
 coryli (Demas), 63, 109, 205, 314
 Cosmorhoë, 8
 cossus (Cossus), 19
 cossus (Trypanus), 19
 costovata (Melanippe), 320
 crabroniformis (Trochilium), 89
 Craspedia, 47
 cratægata (Rumia), 92, 181
 cratægi (Aporia), 57, 144, 215, 253, 273, 274, 278, 279, 300
 crenata (Glyphisa), 136
 crepuscularia (Tephrosia), 182, 202
 cribrum (Coscina), 211
 cristana (Peronea), 262
 cruciana (Hypermezia), 115
 cruciferarum (Plutella), 20
 cubicularis (Caradrina), 293
 cucubali (Diantheia), 160, 208, 287
 cucullata (Anticlea), 46, 64
 cucullatella (Nola), 89
 culmellus (Crambus), 292
 cuprealis (Aglossa), 68, 126
 cursoria (Agrotis), 134
 curtula (Pygæa), 109
 cydno (Heliconius), 30
 cyllarus (Lycæna), 52, 209, 275, 301
 cytherea (Cerigo), 293
 cytisaria (Pseudoterpna), 200, 292, 318
 cypris (Morpho), 119, 230
 dahlia (Noctua), 63
 damon (Lycæna), 129, 275

- daphne* (*Argynnis*), 50, 123, 244, 274
daplidice (*Pieris*), 49, 112, 251, 253, 274
davus (*Cænonympha*), 96, 285, 319
deceptaria (*Erastria*), 203
decolorata (*Emmelesia*), 163, 183, 292
defoliaria (*Hybernia*), 22, 25, 94, 117, 183
degeneraria (*Acidalia*), 212, 317
deione (*Melitæa*), 244, 274, 301
deiphile (*Prepona*), 254
demialba (*Adelpha*), 230
dentina (*Hadena*), 160, 208
deplana (*Lithosia*), 64, 319
Depressaria, 20
derasa (*Habrosyne*), 92, 93
derasa (*Thyatira*), 65, 109, 292, 315
derivalis (*Herminia*), 292
desfontainii (*Melitæa*), 317
designata (*Coremia*), 184
designata (*Larentia*), 203
despecta (*Cænobia*), 126
deversaria (*Acidalia*), 209
dia (*Argynnis*), 207
dictæa (*Notodonta*), 63, 109
dictæa (*Pheosia*), 65, 109
dictæoides (*Pheosia*), 64, 65, 66
dictynna (*Melitæa*), 207, 244, 249, 274, 301
didyma (*Apamea*), 65, 161
didyma (*Mel.*), 73, 207, 209, 274, 279, 301
didymata (*Larentia*), 183
diluta (*Asphalia*), 293
dilutata (*Oporabia*), 183
dilutaria (*Acidalia*), 25, 163, 285
dilutaria (*Ptychopoda*), 45
dimidiata (*Acidalia*), 82, 199
dimidiata (*Ptychopoda*), 43, 45
diniensis (*Leptidia*), 123, 274
dipsacea (*Heliothis*), 315
dispar (*Chrysophanus*), 113, 124, 207
dispar (*Liparis*), 70
dispar (*Lymantria*), 211
dispar (*Ocneria*), 285
dissimilis (*Hadena*), 160
dissimilis (*Mamestra*), 206, 207, 208, 227
ditrapezium (*Noctua*), 291
dolobrararia (*Eurymene*), 63, 64, 181, 315
dominula (*Callimorpha*), 69, 136, 318, 319
dorilis (*Chrysophanus*), 203, 204, 274
dorus (*Cænonympha*), 51, 275
dotata (*Cidaria*), 199, 292
dotata (*Lygris*), 199
doubledayaria (*Amphi.*), 65, 67, 116, 181
dromedarius (*Notodonta*), 63, 94, 109, 207, 261, 280
dromus (*Erebica*), 248, 274
dryas (*Satyrus*), 124, 273, 274
dubitana (*Eupœcilia*), 116
dubitata (*Triphosa*), 184, 204
dumerili (*Luperina*), 136
dumetana (*Tortrix*), 115
duplaris (*Cymatophora*), 66, 92, 93, 109, 208, 315
duponcheli (*Leptidia*), 49
duponcheliana (*Phtheochroa*), 20
ectypa (*Tortrix*), 292
edusa (*Colias*), 22, 25, 29, 50, 86, 90, 92, 93, 94, 116, 140, 216, 251, 253, 274, 279, 283, 300
egæjeus (*Papilio*), 186
egea (*Polygonia*), 50
egeria (*Pararge*), 25, 29, 63, 87, 251, 253, 274, 278, 282, 294, 319
electra (*Colias*), 216
eleus (*Chrysophanus*), 31, 52, 274
elinguararia (*Crocallis*), 181, 292
elisa (*Argynnis*), 50
ellops (*Zaretas*), 230
elpenor (*Chærocampa*), 64, 320
elutata (*Hypsi.*), 30, 67, 92, 163, 184, 292
elva (*Microtia*), 229
elymi (*Tapinostola*), 80, 282
emargana (*Rhacodia*), 285
emarginata (*Acidalia*), 8, 207, 209
emortualis (*Zanclognatha*), 209
emutaria (*Leptomeris*), 46
enagoras (*Papilio*), 254
encelades (*Papilio*), 140
Eois, 7, 9
Ephyra, 7
ephiates (*Zygæna*), 210
epistrophis (*Morpho*), 168
erate (*Colias*), 216
ericetaria (*Selidosema*), 182
erinnys (*Erebica*), 247
eros (*Lycæna*), 249, 274
erosaria (*Ennomos*), 65, 66
erythrocephala (*Orrhodia*), 202, 227
escheri (*Lycæna*), 251, 253, 274, 279, 301
estreyeriana (*Epiblema*), 312
eubule (*Catopsilia*), 230
eumedon (*Lycæna*), 207, 275
eumene (*Mesosemia*), 94
euphemus (*Lycæna*), 124
eupheno (*Euchloë*), 246
euphenoides (*Euchloë*), 49, 245, 251, 253, 274
euphorbiæ (*Deilephila*), 69, 113
euphorbiata (*Minoa*), 63
euphrosyne (*Argynnis*), 274, 279, 301
Eupithecia, 69
euryale (*Erebica*), 212, 274
eurytheme (*Colias*), 216
evajous (*Talmenes*), 186
evias (*Erebica*), 28, 31, 51, 245, 274, 301
exanthemata (*Leptomeris*), 6
exanthemata (*Cabera*), 182
excæcatus (*Calasymphobolus*), 111
exiguata (*Eupithecia*), 93, 184
expallidana (*Catoptria*), 100, 287
exoleta (*Calocampa*), 160, 202, 227
extersaria (*Acidalia*), 82
extersaria (*Boarmia*), 207
extranea (*Leucania*), 287
exulans (*Zygæna*), 114
fagi (*Stauropus*), 64, 66, 259
falcataria (*Drepana*), 108, 204
falcula (*Platypteryx*), 63
farinalis (*Pyrallis*), 20
farinata (*Lithostegia*), 205

- fasciana (Erastria), 207
 fasciaria (Ellopiia), 181, 188, 315
 fasciuncula (Miana), 66, 314
 favicolor (Leucania), 215, 287
 feisthamelii (Papilio), 278, 300
 fentoni (Nodaria), 74
 ferrugalis (Pionea), 20
 ferrugata (Coremia), 184, 292
 ferrugata (Larentia), 203, 204
 fervida (Phragmatobia), 19
 festiva (Noctua), 134, 287, 291
 festuæ (Plusia), 80, 180, 209, 291
 fidia (Satyrus), 51, 275
 filicata (Acidalia), 18
 filigrammaria (Oporabia), 183
 filipendulæ (Anthrocera), 29
 filipendulæ (Zygæna), 114, 118, 293, 319
 fimbria (Triphæna), 65, 66, 293
 fimbria (Agrotis), 208
 fimbrialis (Thalera), 226
 firmata (Thera), 188
 flammealis (Endotricha), 294
 flavago (Xanthia), 159
 flavella (Depressaria), 127
 flavicincta (Polia), 93
 flavicinctata (Larentia), 183
 flavicornis (Asphalia), 64, 202
 flavidorsana (Dichrorampha), 240
 flexula (Aventia), 64, 209
 floralis (Noctuella), 20
 fluctuata (Larentia), 18
 fluctuata (Melanippe), 67, 184, 320
 fontis (Bomolocha), 205
 fovealis (Duponchelia), 20
 formiciformis (Sesia), 126
 forsterana (Tortrix), 115, 135, 292
 fraxini (Catocala), 227, 283
 frequentella (Scoparia), 292
 fritillum (Hesperia), 274
 fuciformis (Hemaris), 89
 fuliginosa (Phragmatobia), 19, 64, 89
 fuliginosa (Spilosoma), 64, 89
 fulva (Tapinostola), 133, 208, 227, 287
 fulvago (Cosmia), 159
 fulvago (Xanthia), 65, 159
 fulvata (Cidaria), 63, 199
 fumata (Acidalia), 8, 200, 203
 fumata (Leptomeris), 48
 funerella (Anesychia), 127
 furcifera (Xylina), 202, 227
 furcula (Diceranura), 63, 109
 furcula (Cerura), 109, 209, 262, 320
 furfurana (Bactra), 127
 furuncula (Miana), 134, 292
 furva (Mamestra), 133, 208
 fusca (Phycis), 119
 fuscata (Hybernia), 118
 fuscantaria (Ennomos), 64, 65, 67
 fusconebulosa (Hepialus), 108
 fuscula (Erastria), 94
 galactodactyla (Acipitilia), 137
 galatea (Melanargia), 51, 92, 210, 274,
 301, 315, 317
 galiata (Larentia), 210
 galiata (Melanippe), 93, 137, 184, 210
 galii (Deilephila), 88, 113
 gamma (Plusia), 18, 26, 163, 180
 garleppiana (Prepona), 254
 gaudialis (Chlosyne), 229
 gelon (Papilio), 140
 gemmaria (Boarmia), 182, 286
 gemina (Apamea), 65
 gemina (Hadena), 208
 geminipuncta (Nonagria), 201
 genistæ (Hadena), 65, 203, 214
 genistæ (Mamestra), 207
 gilvago (Xanthia), 66
 gilvaria (Aspilates), 18, 61
 glabra (Orrhodia), 227
 glabraria (Cleora), 30, 94, 286, 315
 glacialis (Erebina), 139, 247, 275, 316
 glareosa (Noctua), 63, 134, 160
 glaucata (Colix), 64, 109
 glaucicolella (Coleophora), 285
 glyphica (Euchlidia), 180, 190
 gonostigma (Orgyia), 63, 70
 goossensiata (Eupithecia), 227
 gordius (Chrysophanus), 300
 gorge (Erebina), 247, 274, 316
 gorgone (Erebina), 247, 274, 316
 gothicina (Tæniocampa), 159
 gracilis (Tæniocampa), 202, 286
 grammica (Coscinia), 19
 grammica (Emydia), 136
 graminis (Charcis), 81, 133, 227
 granella (Tinea), 137
 grisealis (Zanclognatha), 180, 185
 griseola (Lithosia), 207
 grossulariata (Abraxas), 30, 64, 182, 188,
 262, 287
 grossulariata (Spilote), 262
 gryphipennella (Coleophora), 261
 guenéei (Luperina), 136
 halimede (Melanargia), 124
 harpagula (Drepana), 136
 hastiana (Acalla), 164
 hastiana (Peronea), 30, 287
 hastata (Larentia), 203
 hastata (Melanippe), 184
 haworthii (Celæna), 134, 227
 hectus (Hepialus), 64, 315
 helice (Colias), 29, 112, 116, 140
 hellmanni (Tapinostola), 208
 helvola (Orthosia), 159, 227
 helvola (Anchocelis), 203
 heparata (Eupisteria), 203
 herbariata (Acidalia), 82
 herbida (Agrotis), 315
 hermione (Satyrus), 274
 hessii (Nonagria), 319
 hesperus (Papilio), 117
 Heterogynis, 95
 hexadactyla (Orneodes), 20
 hippocastanaria (Pachycnemis), 315
 hippocrepidis (Zygæna), 118
 hippophaës (Deilephila), 113
 hippothoë (Chrysophanus), 124, 274
 hirtaria (Biston), 67, 189, 216

- hispidus* (*Heliophobus*), 318
hispulla (*Epinephele*), 51, 257, 274, 278, 279, 301
hospiton (*Papilio*), 49
humiliata (*Acidalia*), 216
humiliata (*Ptychopoda*), 46
humuli (*Hepialus*), 64, 108
hyale (*Colias*), 25, 29, 50, 123, 216, 226, 274, 300
hybridus (*Smerinthus*), 127
hyemana (*Tortricodes*), 116
hyerana (*Hastula*), 118, 190
hygiæa (*Vanessa*), 70
hylas (*Lycæna*), 211, 245
hyperanthus (*Aphantopus*), 87, 95, 124, 259, 301
hyperanthus (*Epinep.*), 95, 274, 279, 319
hyperia (*Chlosyne*), 229
hypericana (*Catoptera*), 81
ianira (*Epinephele*), 25, 29, 64, 316
ianthina (*Triphæna*), 64, 65, 66, 158, 208
ianthina (*Agrotis*), 208
iberica (*Melitæa*), 251, 252, 317
icarus (*Lycæna*), 25, 210, 251, 252, 261, 301
ichneumoniformis (*Sesia*), 210
ichnusa (*Vanessa*), 50
ictericana (*Cnephasia*), 20
itericana (*Sphaleroptera*), 81, 116
ida (*Epinephele*), 51, 244, 251, 275
ide (*Siderone*), 230
ignobilis (*Eceticus*), 11, 13
ilia (*Apatura*), 206
ilicifolia (*Epinaptera*), 136
ilicifolia (*Gastropacha*), 136
ilicis (*Thecla*), 51, 244, 251, 253, 274, 275, 301
illuminatella (*Argyresthia*), 284, 286
illunaria (*Selenia*), 166, 181
imbutata (*Anaitis*), 120, 199
imitaria (*Acidalia*), 80, 287, 292, 315
imitaria (*Leptomeris*), 10
immaculata (*Argynnis*), 50
immanata (*Cidaria*), 30, 199
immorata (*Acidalia*), 8, 204
immorata (*Leptomeris*), 46
immundana (*Epiblema*), 281, 311
immutata (*Acidalia*), 8, 199, 204, 212
impudens (*Leucania*), 208
impura (*Leucania*), 65, 80, 110, 208
inachis (*Kallima*), 190
incarnatus (*Spilonota*), 115
incanana (*Cnephasia*), 98
incanaria (*Acidalia*), 285
incanata (*Leptomeris*), 46
incerta (*Tæniocampa*), 207
indigenata (*Euerostes*), 18
innotata (*Eupithecia*), 201
ino (*Argynnis*), 207
inopiana (*Ephippiphora*), 127
inornata (*Ptychopoda*), 43, 44
insignis (*Clothilda*), 229
instabilis (*Tæniocampa*), 65
interjectaria (*Ptychopoda*), 8, 10, 44
interjecta (*Tri.*), 66, 80, 92, 93, 140, 158
intermedia (*Erebia*), 274, 316
intermedia (*Erebia*), 245, 316
interrogationis (*Plusia*), 26, 180
io (*Vanessa*), 31, 87, 163, 168, 203, 227, 301
iota (*Plusia*), 26, 65, 80, 163, 180, 238
iphigenia (*Hypena*), 230
iphis (*Cœnonympha*), 275
iphis (*Cœnonympha*), 207, 209
iris (*Apatura*), 70, 140, 207, 216, 285, 316
irrorella (*Setina*), 63, 210
isabellæ (*Graellsia*), 216
jacobææ (*Euchelia*), 89, 185, 214, 216, 237, 265
jacobææ (*Hipoerita*), 89, 265, 267
jasius (*Charaxes*), 50
jasoniata (*Eupithecia*), 240
jaspidea (*Nænia*), 227
juniperata (*Thera*), 184
jurtina (*Epinephele*), 29, 30, 51, 209, 251, 274, 278, 301
karwinskii (*Smyrna*), 230
kershawii (*Vanessa*), 186
lacertinaria (*Drepana*), 108, 206
lachesis (*Mel.*), 51, 244, 274, 278, 301, 317
lactearia (*Thalera*), 65, 200
lactearia (*Iodis*), 200, 315
lacteella (*Endrosis*), 164
lævis (*Orthosia*), 227
l-album (*Leucania*), 208
lancealis (*Perinephele*), 294
lanceolana (*Bactra*), 100
lanestris (*Eriogaster*), 108, 120, 287
lanestris (*Lachneis*), 29
laodice (*Argynnis*), 124
lappona (*Erebia*), 245, 248, 274
laponaria (*Nyssia*), 69, 168, 216, 237
lariciata (*Eupithecia*), 64
laripennella (*Coleophora*), 285
latefasciata (*Limenitis*), 123
latenai (*Mamestra*), 206
lateritia (*Hadena*), 208
lathona (*Argynnis*), 90
lathonia, 207, 209, 227, 274, 279, 301
latonia (*Argynnis*), 112, 226
lathyrus (*Leptidia*), 49
latreillellus (*Nemotois*), 20
lavateræ (*Carcharodus*), 248, 274
**leechi* (*Nodaria*), 74
lefebvrei (*Erebia*), 245, 247, 248, 274, 301, 316
lemnata (*Cataclysta*), 1, 38, 42, 90
leosthenes (*Papilio*), 187
leporina (*Acronycta*), 96, 109, 206, 208, 287, 289
Leptomeris, 6, 8, 47
leucophæa (*Mamestra*), 205
leucophæa (*Pachetra*), 287
leucophæaria (*Hybernia*), 183, 202
levana (*Araschnia*), 207
lewini (*Clania*), 11, 13
libatrix (*Gonoptera*), 65, 180
lichenaria (*Boarmia*), 209
lichenaria (*Cleora*), 80, 287, 315
lidderdalii (*Bhutanitis*), 31

- henigianus* (*Leioptilus*), 191
ligea (*Erebica*), 212
ligniperda (*Cossus*), 19, 64, 66, 208, 315
ligula (*Orrhodia*), 125, 159
ligustri (*Acronycta*), 110, 291, 315
ligustri (*Craniophora*), 110
ligustri (*Sphinx*), 64
limitata (*Eubolia*), 199
limitata (*Ortholitha*), 210
limoniella (*Goniodyma*), 285
limosipennella (*Coleophora*), 285
linariata (*Eupithecia*), 183
linariata (*Tephroclystis*), 183
linea (*Adopæa*), 120
linea (*Hesperia*), 92
lineago (*Xanthia*), 227
lineola (*Adopæa*), 120, 207, 274
lineola (*Hesperia*), 226
l-nigrum (*Laria*), 206
linogrisea (*Agrotis*), 205, 208
liria (*Ectima*), 230
literosa (*Miana*), 80, 93, 134
litrata (*Mac.*), 182, 188, 262, 285, 287, 315
litrata (*Semiothisa*), 209
litura (*Orthosia*), 159, 227
litarella (*Depressaria*), 164
lithargyria (*Leucania*), 64, 65, 110
lithoxylea (*Xylophasia*), 65, 160
lividalis (*Hypena*), 18
livornica (*Deilephila*), 137, 162, 186, 313
lixella (*Coleophora*), 285
lobulata (*Lobophora*), 184
longana (*Cnephassa*), 20
lonicera (*Zygæna*), 209
lota (*Orthosia*), 94, 159
lubricipeda (*Spilosoma*), 64, 90
lucina (*Nemeobius*), 63, 88, 275, 295
leucostigma (*Hydræcia*), 208
luctuosa (*Acontia*), 63, 65, 136, 210, 214
lucernea (*Agrotis*), 240, 320
lunaria (*Selenia*), 181, 186
lunaris (*Ophiodes*), 191, 207
lunigera (*Agrotis*), 70, 94, 136
lunosa (*Orthosia*), 65
lunula (*Calophasia*), 82
lupulinus (*Hepialus*), 108
luridata (*Boarmia*), 204
luridata (*Tephrosia*), 205
lurideolata (*Lithosia*), 89
lutea (*Xanthia*), 227
lutealis (*Scopula*), 292
luteata (*Asthenia*), 6, 64, 199, 203, 204
luteolata (*Rumia*), 181
lutescens (*Phytometra*), 213
lutosa (*Nonagria*), 282
lutulenta (*Epunda*), 65
lutulenta (*Aporophyla*), 227
lycaon (*Epinephele*), 211, 226
lychnitis (*Oecellia*), 191
lycidas (*Lycæna*), 248, 275
lyllus (*Cœnonympha*), 51
lysida (*Kricogonia*), 229
macheralis (*Pyrausta*), 198
machaon (*Papilio*), 122, 251, 274, 278, 282, 300, 320
macilenta (*Orthosia*), 65, 159
macleayana (*Papilio*), 139
macularia (*Mesene*), 230
macularia (*Venilia*), 181
maculata (*Venilia*), 231
maculipennis (*Plutella*), 20
mæra (*Pararge*), 211, 212, 253, 274, 301
magnella (*Lepidoscia*), 12, 14
major (*Morpha*), 226
malvæ (*Hesperia*), 203, 254, 301
malvæ (*Syrichthus*), 29, 63, 261, 275
manto (*Erebica*), 275
margaritaria (*Metrocampa*), 181
marginata (*Lomaspilis*), 183
marginaria (*Hybernia*), 29, 96, 118, 183
marginepunctata (*Acidalia*), 209, 214
marginepunctata (*Leptomeres*), 10, 43
maritima (*Senta*), 126, 201
matura (*Cerigo*), 65, 80
maura (*Mania*), 65, 66, 70, 158, 286, 291
medesicaste (*Thais*), 244, 274, 278, 300
medon (*Lycæna*), 93
megæra (*Pararge*), 51, 87, 211, 251, 252, 274, 282, 295, 301
megacephala (*Acronycta*), 65, 109, 208
melanocephala (*Acronycta*), 289
melanocephalum (*Trochilium*), 206
melanops (*Lycæna*), 52, 94, 226, 275
meleager (*Lycæna*), 52
melas (*Erebica*), 205, 280, 301
melete (*Pieris*), 123
meliloti (*Zygæna*), 207
memnon (*Caligo*), 230
mendica (*Spilosoma*), 89
mensuraria (*Eubolia*), 199
menthastri (*Spilosoma*), 64, 90, 259, 311
menyanthidis (*Acro.*), 110, 206, 226, 227
meridionalis (*Melanargia*), 124
mesomella (*Cybosia*), 89, 210
mesomella (*Lithosia*), 315
meticulosa (*Brotolomia*), 227
metirius (*Hypocysta*), 139, 187
metis (*Apatura*), 275
mexicana (*Eurema*), 229
mi (*Euclidia*), 180
miata (*Cidaria*), 183
micæa (*Hydræcia*), 65, 133, 211, 314
milleri (*Caradrina*), 205, 209
milhauseri (*Hoplitis*), 82, 200, 209
miniata (*Calligenia*), 287, 315
minima (*Lyc.*), 63, 88, 117, 201, 211, 286
minimus (*Lycæna*), 274
ministrana (*Tortrix*), 115
minorata (*Larentia*), 212
minutata (*Eupithecia*), 184
minutata (*Tephroclystis*), 184
misippus (*Hypolimnas*), 117
mnemosyne (*Parnassius*), 274, 280
modesta (*Pachysphinx*), 111
molothina (*Agrotis*), 205
monacha (*Lymantria*), 211

- monacha (Psilura), 315
 moneta (Plusia), 64, 65, 138, 260, 280, 281
 monodactylus (Pterophorus), 20, 96, 292
 monoglypha (Hadena), 280, 227
 monoglypha (Xylophasia), 65
 monogramma (Metoptria), 18, 190
 montanata (Melanippe), 184
 morpheus (Caradrina), 134, 207
 morpheus (Heteroptus), 273, 274
 multistrigaria (Larentia), 183, 319
 mundana (Nudaria), 89, 292
 muricata (Hyria), 7, 199
 murinata (Minoa), 202
 muscerda (Lithosia), 207, 208
 musculosa (Synia), 136, 162, 287
 mylotes (Papilio), 229
 myopæformis (Sesia), 63
 myrtillana (Phoxopteryx), 115
 myrtilli (Anarta), 63, 96, 180, 227, 285
 nanata (Eupithecia), 184
 nanata (Tephroclystia), 184
 napi (Pieris), 25, 29, 94, 197, 198, 202, 259, 274, 300, 319
 nebulosa (Aplecta), 29, 30, 160, 187, 205, 287, 291
 neglecta (Noctua), 63
 nemesis (Dismorphia), 119
 nemoralis (Agrotera), 261
 neomyris (Satyrus), 51
 neoridas (Erebia), 275
 neoterpe (Prepona), 254
 nerii (Daphnis), 113
 nerii (Deilephila), 198
 nerii (Sphinx), 197
 neurica (Nonagria), 319
 neustria (Malacosoma), 64, 292
 nicholli (Erebia), 139, 316
 nictitans (Hydræcia), 30, 65, 66, 126, 133, 208, 227
 nigricans (Agrotis), 66, 227
 nigrofasciata (Anticlea), 184, 188
 nigrofulvata (Macaria), 188, 262, 285
 niobe (Argynnis), 112, 207, 209, 274
 nitida (Orthosia), 227
 nitidella (Epichnopteryx), 206
 niveus (Acentropus), 1, 126
 noctuella (Nomophila), 20, 81
 nomion (Parnassius), 122
 notata (Macaria), 182, 315
 notata (Semiiothisia), 165
 nubeculosa (Asteroscopus), 202
 nudalis (Phlyctænodes), 20
 numata (Heliconius), 165, 317
 nupta (Catocala), 209, 227, 259, 285
 nymphæata (Hydrocampa), 42
 obeliscata (Larentia), 227
 obelisca (Agrotis), 93
 oberthuri (Lycæna), 241, 316
 oblitterata (Eupisteria), 7, 204
 obscura (Agrotis), 206, 208
 obscuraria (Gnophos) 182, 209, 292, 315, 319
 obsitalis (Hypena), 18
 obsoleta (Chloridea), 258
 obsoleta (Leucania), 126, 201
 obtusella (Coleophora), 285
 occulta (Agrotis), 205, 208
 ocellaris (Xanthia), 227
 ocellata (Melanthia), 184
 ocellata (Larentia), 204
 ocellatus (Smerin.) 29, 63, 64, 66, 89, 237
 ocellatus (Aphantopus), 124
 ocella (Eromene), 240
 ochracea (Gortyna), 65, 123, 256
 ochracea (Ochria), 261
 ochrata (Acidalia), 9, 317
 ochrata (Sterrhia), 45
 ochrearia (Aspilates), 18, 214
 ochroleucata (Acidalia), 82
 octavia (Morpho), 230
 octogesima (Cymatophora), 215, 238, 287
 octomaculata (Ennychia), 292
 ocularis (Cymatophora), 63, 215, 238
 oculea (Apamea), 161
 occultana (Pædisca), 116
 œdippus (Cœnonympha), 124, 273, 274
 œme (Erebia), 275
 oleracea (Hadena), 64, 66
 oleracea (Mamestra), 227
 olivata (Larentia), 183
 oo (Dicycla), 286, 287
 opacella (Acanthopysehe), 206
 ophiogramma (Apamea), 161, 208
 opima (Tæniocampa), 70, 192, 202
 or (Cymatophora), 63, 203, 208, 287, 315
 orbicularia (Ephyra), 315
 orbitulus (Lyc.), 241, 246, 247, 248, 316
 orbona (Triphæna), 66, 140, 158
 orbona (Agrotis), 205
 orientalis (Pieris), 122
 orion (Lycæna), 301
 orion (Moma), 206, 315
 ornata (Acidalia), 206
 ornitopus (Xylina) 227
 osseana (Aphelia), 164
 osseana (Cnephassia), 293
 oxyacanthæ (Miselia), 160
 pabulatricula (Hadena), 208
 palæmon (Carterocephalus), 22, 275
 palæno (Colias), 226, 275
 palarica (Erebia), 28, 30
 paleacea (Cosmia), 159, 209
 pales (Argynnis), 245, 248, 274
 pallens (Leucania), 65, 110
 pallescens (Argynnis), 123
 palpina (Pterostoma), 64, 109, 259, 262
 paludata (Anaitis), 120, 199
 paludis (Hydræcia), 30
 palustris (Hydrilla), 136
 palustris (Zygæna) 293
 pamphilus (Cœnonympha), 25, 51, 209, 259, 274, 285, 316, 319
 pandora (Argynnis), 50, 275
 paphia (Argynnis), 50, 87, 294, 315
 paphia (Dryas), 207, 209
 Papilio, 30
 papilionaria (Geometra), 207, 209
 parthenias (Brepheos), 181, 202

- parthenie (Melitæa), 50, 248, 274
 paralekta (Kalima), 190
 parva (Micra), 287
 parva (Thalpochares), 18, 287
 parvipuncta (Cyaniris), 52
 pasiphaë (Epinephele), 51, 244, 251, 275
 pasithoë (Heliconius), 117
 pastinum (Toxocampa), 208, 287
 pavonia (Saturnia), 29, 108, 292
 pectinitaria (Larentia), 183, 239
 pedaria (Phigalia), 65, 96, 181, 202
 pendularia (Ephyra), 207
 pendularia (Zono.), 29, 64, 189, 216, 262
 pennaria (Himera), 65, 181
 pentadactyla (Aciptilia), 292
 peranthus (Papilio), 140
 perla (Bryophila), 65, 109
 perlellus (Crambus), 294
 permutaria (Peronea), 115, 287
 perochraria (Acidalia), 212
 perochraria (Ptychopoda), 11
 persicariæ (Mamestra), 63, 65, 133, 291
 petasitis (Hydræcia), 133
 petiverella (Dichrorampha), 116
 petraria (Panagra), 182
 pfugiana (Ephippiphora), 116
 pharnaces (Papilio), 228
 pheretes (Lycæna), 316
 phicomene (Colias), 216, 248, 274
 philodice (Colias), 216
 phloæas (Chrysophanus), 31, 52, 203, 226,
 251, 274, 301, 320
 phœbe (Melitæa), 274, 278
 picteti (Ala), 23
 picteti (Trichanarta), 23
 pigra (Pygæra), 27, 62
 pilosaria (Phigalia), 181
 pilosellæ (Zygæna), 287
 pinastri (Sphinx), 113, 206
 pinguinalis (Aglossa), 20
 pini (Dendrolinus), 211, 227
 piniaria (Bupalus), 182, 188, 209, 315
 piniariella (Oenoseroma), 284
 pinicolana (Retinia), 116
 piniperda (Panolis), 65, 131, 159
 pinivorana (Retinia), 116
 pisi (Hadena), 80, 160
 pistacina (Orthosia), 129, 159
 pitheas (Catagramma), 229
 plagata (Anaitis), 18, 199
 plagiodactyla (Stenoptilia), 20
 plantaginis (Parasemia), 89
 plantaginis (Nemeophila), 89, 168
 plecta (Agrotis), 227
 plecta (Noctua), 66, 134, 320
 plexippus (Anosia), 112
 plexippus (Danaïs), 112
 plotina (Melitæa), 123
 plumaria (Selidosema), 182
 plumigera (Ptilophora), 314
 plumbaria (Eubolia), 199
 plumbaria (Ortholitha), 204
 plumbeolata (Eupithecia), 93
 Plusia, 25
 podalirius (Papilio), 245, 274, 300
 podana (Tortrix), 115, 135
 poggei (Pseudacraea), 139
 poliographus (Colias), 123
 polychloros (Eugonia), 261, 274, 316
 polychloros (Vanessa), 25, 87, 210, 253,
 261, 274, 301
 polycommata (Lobophora), 184
 polygramma (Thalpochares), 82
 polygrammata (Phibalapteryx), 209
 polyodon (Cloantha), 208
 polyodon (Xylophasia), 30
 polyphemus (Morpho), 230
 pomonella (Carpocapsa), 198
 populana (Ephippiphora), 287
 popularis (Epineuron), 133, 211, 227
 popularis (Heliophobus), 63
 popularis (Neuron), 65, 93
 populata (Cidaria), 199
 populella (Gelechia), 118
 populeti (Tæniocampa), 159
 populi (Amorpha), 212
 populi (Limenitis), 206
 populi (Pœcilocampa), 30, 63, 64, 108
 populi (Smerinthus), 63, 64, 66, 287
 porcellus (Chær.), 64, 138, 263, 291, 319
 porcellus (Metopsilus), 88, 207
 porcellus (Pergesa), 196, 198
 porphyrea (Agrotis), 315
 porphyrea (Hadena), 227
 potatoria (Cosmotricha), 108
 potatoria (Odonestis), 80, 108, 287
 præformata (Anaitis), 212
 prasina (Agrotis), 205, 208
 prasinana (Halias), 63
 prasinana (Hylophila), 89, 207
 pretiosa (Ala), 23
 primulæ (Agrotis), 206
 proboscidalis (Hypena), 65, 180, 259
 procida (Melanargia), 51
 procellata (Melanippe), 64
 procellata (Melanthia), 287
 prodromaria (Amphidasys), 181
 progemmaria (Hybernaria), 118
 promissa (Catocala), 226
 promotata (Acidalia), 94, 214, 293
 pronœ (Erebia), 275
 pronuba (Triphæna), 168
 pronuba (Agrotis), 227
 pronubana (Tortrix), 20
 propugnata (Coremia), 319
 prosapiaria (Ellopiæ), 65, 181, 188, 209,
 315
 protea (Dryobota), 227, 319
 proto (Hesperia), 275
 provincialis (Melitæa), 50
 prunaria (Angerona), 216, 287, 315
 prunata (Cidaria), 199, 209
 prunata (Lygris), 199
 pruni (Odonestis), 211
 pruni (Thecla), 113, 262, 275, 286
 pruinata (Pseudoterpna), 30, 65, 200, 318
 psi (Acronycta), 65, 109, 285
 psittacata (Cidaria), 92

- Psyche, 19
 pylorita (*Lycæna*), 198
 Ptychopoda, 8
 pudibunda (*Dasychira*), 64, 108, 205, 207
 pudica (*Euprepia*), 19
 pudica (*Cymbalophora*), 19
 pudorina (*Leucania*), 208
 puera (*Hyblæa*), 198
 pulchella (*Utetheisa*), 19
 pulchella (*Deiopeia*), 19, 136
 pulchellata (*Eupithecia*), 183
 pulchellata (*Tephroclystia*), 183
 pulchrina (*Plusia*), 26, 180, 238
 pulla (*Epichnopteryx*), 206, 260
 pulveraria (*Numeria*), 182
 punctaria (*Ephyra*), 204
 punctularia (*Tephrosia*), 94, 165, 202, 204
 pumilata (*Eupithecia*), 292
 pumilata (*Tephroclystia*), 18
 purpuralis (*Zygæna*), 209
 purpurata (*Rhyparia*), 211
 pusaria (*Cabera*), 182
 pusaria (*Deilinia*), 204
 puta (*Agrotis*), 65, 134, 135, 214
 putata (*Thalera*), 203
 putris (*Axylia*), 65, 66, 80, 93, 293
 Pylarge, 8, 48
 pyraliata (*Cidaria*), 199
 pyramidea (*Amphipyra*), 63, 209, 226
 pyranthe (*Catopsilia*), 255
 pyrenaica (*Erebia*), 245, 280, 301
 pyrenaica (*Lycæna*), 241, 246, 247, 248, 274, 316
 pyrenæa (*Erebia*), 245, 274, 316
 pyrina (*Zeuzera*), 64, 66, 168
 quadra (*Gnophria*), 89
 quadra (*Enistis*), 89, 211
 quadratus (*Papilio*), 125
 quadrifasciaria (*Larentia*), 207
 quadripunctata (*Caradrina*), 65, 208
 questionana (*Dichrorampha*), 240
 quercana (*Hylophila*), 92
 quercifolia (*Lasiocampa*), 64, 198, 262, 292
 quercifolia (*Gastropacha*), 64, 198, 262
 quercifoliella (*Lithocolletis*), 216
 quercinaria (*Ennomos*), 65, 181, 211
 quercus (*Bombyx*), 90, 108
 quercus (*Lasiocampa*), 69, 90, 94, 108, 144, 203
 quercus (*Thecla*), 294
 quercus (*Zephyrus*), 88, 206, 211, 275
 quinque maculata (*Phlegeth.*), 113
 ramella (*Grapholitha*), 115
 ramulanus (*Sarothripus*), 114
 rapæ (*Pieris*), 25, 122, 137, 251, 253, 259, 300
 rectangulata (*Chloroclystis*), 184
 rectangulata (*Eupithecia*), 84, 184, 239
 rectilinea (*Hyppa*), 207
 remutaria (*Acidalia*), 8
 repandata (*Boar.*), 29, 30, 69, 163, 182, 188
 reticulata (*Neuria*), 80, 206, 214
 reticulata (*Lygris*), 212
 revayana (*Sarothripus*), 214
 rhamni (*Gonepteryx*), 87, 251, 300
 rhomboidaria (*Boarmia*), 67, 163, 182
 rhizolitha (*Xylina*), 94
 ribeana (*Tortrix*), 115
 ribesaria (*Cidaria*), 292
 richmondii (*Ornithoptera*), 187
 ripæ (*Agrotis*), 291
 ripartii (*Lycæna*), 52
 rivata (*Melanippe*), 94, 287
 roboraria (*Boarmia*), 182, 207, 209
 roboris (*Læosopis*), 51, 244, 246, 274, 278, 301
 robsoni (*Aplecta*), 29, 30, 187, 292
 rosana (*Tortrix*), 115
 rubi (*Bombyx*), 108
 rubi (*Callophrys*), 88, 204, 211, 275, 301
 rubi (*Macrothylacia*), 108, 204, 227
 rubi (*Noctua*), 134
 rubi (*Thecla*), 70, 185, 191, 260
 rubidata (*Anticlea*), 93, 94
 rubiginata (*Acidalia*), 287
 rubiginata (*Melanthia*), 184
 rubiginea (*Dasyampa*), 202
 rubiginea (*Orrhodia*), 227
 rubricollis (*Gnophria*), 315
 rubricosa (*Pachnobia*), 68, 70, 159, 202, 314
 rufa (*Cænobia*), 261
 rufana (*Catoptria*), 100
 rufina (*Orthosia*), 159
 rugosana (*Phtheochroa*), 214, 239
 rumina (*Thais*), 274, 278, 300
 rumicis (*Acronycta*), 80, 110, 206, 208, 227
 rupicaprararia (*Hybernina*), 96, 117, 183
 rurea (*Xylophasia*), 66
 russata (*Cidaria*), 30, 185, 320
 russula (*Euthemonia*), 30
 russula (*Diacrisia*), 89
 russula (*Nemeophila*), 89, 166, 286, 314
 rusticata (*Acidalia*), 8, 43, 261
 rusticata (*Ptychopoda*), 43, 44
 rutilus (*Chrysophanus*), 207
 sacraria (*Rhodometra*), 18
 sacraria (*Sterrhæ*), 18, 119
 salicata (*Larentia*), 18, 183
 salicis (*Liparis*), 96
 salicis (*Stilpnota*), 64, 66, 111
 salinellus (*Crambus*), 126
 sallei (*Pythonides*), 231
 salmacis (*Hypolimnas*), 119
 salmacis (*Lycæna*), 18
 sambucaria (*Uropteryx*), 65, 66, 181
 saponariæ (*Neuria*), 214
 sanguinalis (*Pyrausta*), 82
 sanio (*Nemeophila*), 227
 sao (*Hesperia*), 245, 301
 sarpedon (*Papilio*), 186
 satellitia (*Scopelosoma*), 159
 saturatella (*Coleophora*), 165
 satyrata (*Tephroclystia*), 204
 satyrata (*Eupithecia*), 63
 saucia (*Agrotis*), 134, 317
 scabiosata (*Eupithecia*), 64
 scabriuscula (*Dipterygia*), 203
 scipio (*Erebia*), 285

- scolaeformis* (Sesia), 203, 207
scoliiformis (Sesia), 113, 163
scolopacina (Hadena), 208, 227
scolopacina (Xylophasia), 294
scutulata (Acidalia), 199, 292
sebrus (Lycæna), 52
secalis (Hadena), 208
segetum (Agrotis), 22, 77
selene (Argynnis), 87, 123, 203, 274, 287
seleni (Caradrina), 82, 205
semele (Satyrus), 25, 51, 87, 210, 226, 274, 282, 301
semiargus (Lycæna), 113, 203, 211
semibrunnea (Xylina), 137, 314, 320
semicanaria (Thamnonoma), 82
semifuscana (Pædisca), 116
sempronius (Charaxes), 186, 187
senex (Nudaria), 81
septodactylus (Leioptilus), 191
sepium (Bacotia), 206
serena (Hecatera), 66
sericea (Lithosia), 81
sericealis (Rivula), 180, 292
serratulæ (Hesperia), 275
sibylla (Limenitis), 62, 90, 207, 275, 282, 316
siculata (Heliconius), 30
siderata (Cidaria), 92, 137, 185
signum (Agrotis), 208
silaceata (Cidaria), 199
silago (Xanthia), 159, 287
silvana (Heliconius), 317
similana (Ephippiphora), 116
similana (Epiblema), 164
similis (Porthesia), 64, 108, 259, 262
simplonia (Euchloë), 274
simulans (Agrotis), 206
simulata (Thera), 184
sinapis (Leucophasia), 29, 86, 207, 274
sinapis (Leptidia), 49, 123, 251, 253, 279, 300
sinuana (Cnephassia), 98
sinuata (Anticlea), 94, 137, 320
smaragdaria (Pseudoterpna), 260, 285, 320
smilax (Terias), 186
sobrina (Noctua), 286
sobrinata (Eupithecia), 64, 161, 184, 227
sobrinata (Tephroclystia), 184
socia (Xylina), 227
sociata (Melanippe), 184
sociella (Aphomia), 292
solandriana (Pædisca), 30, 116
solidaginis (Calocampa), 120, 160, 227
sordida (Hadena), 206, 262
sordidata (Hypsipetes), 30, 81, 184
sororecula (Lithosia), 63
sororeculana (Penthina), 115
spadicea (Orrhodia), 125, 159, 164
sparganii (Nonagria), 136
sparsata (Collix), 204
spartiata (Chesias), 25, 90
sphegiformis (Sesia), 113
sphinx (Asterocephalus), 25, 65
spilodactyla (Acipitilia), 191
spini (Thecla), 52, 275
splendens (Mamestra), 208
sponsa (Catocala), 206, 226
sponsana (Peronea), 115
stabilis (Tæniodactyla), 82
stahli (Ceratopterus), 139
stagnata (Hydrocampa), 1
statices (Ino), 64, 89, 205, 292
statilinus (Satyrus), 51, 275
**steinbachi* (Papilio), 125
stellatarum (Macroglossa), 84, 90, 94
Sterrha, 8, 9
stevensata (Eupithecia), 161
sthenyo (Erebica), 248, 274
sthenelus (Papilio), 186
stonanus (Sarrothripus), 114
straminata (Acidalia), 212
straminea (Leucania), 126
strataria (Amphidasys), 63, 65, 181
Strenia, 8
striata (Euprepia), 19, 211
striata (Coscina), 19, 211
strigaria (Leptomeris), 46
strigata (Hemithea), 200, 207
strigilaria (Leptomeris), 46
strigilis (Miana), 29, 65, 66
strigillaria (Aspilates), 182
strigillaria (Perconia), 182, 209
strigosa (Acronyeta), 126
strigula (Agrotis), 65, 205, 211
stygne (Erebica), 28, 31, 245, 274, 300, 301, 317
suasa (Hadena), 160
suava (Eublema), 82
subalpina (Chrysophanus), 274
subfusca (Noctua), 161, 213
subgothica (Noctua), 136
sublustris (Hadena), 208
sublustris (Xylophasia), 65, 80, 133
subrosea (Noctua), 136
subroseata (Zonosoma), 29
subsericeata (Acidalia), 93, 199, 240
subsericeata (Ptychopoda), 43
subseque (Agrotis), 205
subtristata (Melanippe), 184
suffumata (Cidaria), 199
suffusa (Agrotis), 63, 65
sulphuralis (Eumelia), 18
suspecta (Dyschorista), 159, 209, 227
suspecta (Orthosia), 159
sydi (Limenitis), 123
syllius (Melanargia), 51, 251, 253, 275
sylphis (Bulboneura), 229
sylvata (Abraxas), 182, 261, 292
sylvana (Heliconius), 165
sylvanus (Augiades), 301
sylvanus (Hepialus), 108
sylvanus (Pamphilus), 257, 259
sylvius (Carterocephalus), 203
syringaria (Hygrochroa), 181
syringaria (Pericallia), 65, 163, 181, 287
tabaniformis (Ægeria), 318
tæniate (Emmelesia), 183
tages (Thanaos), 82, 251, 254, 274

- tages (Nisoniades), 261, 295
 taminata (Bapta), 64, 203
 taraxaci (Caradrina), 209
 tarsipennalis (Zanclognatha), 93, 180, 209
 tau (Aglia), 202
 taygetus (Danais), 187
 telemonius (Caligo), 49
 telicanus (Lampides), 52, 251, 275
 temerata (Bapta), 93, 94, 182, 239
 temerata (Corycia), 93, 94
 tempestivata (Tephroclystia), 18
 templi (Dasypolia), 282
 tenebrata (Heliaca), 180
 tenebraria (Dasydia), 139
 tenebrosa (Rusina), 93, 163, 206
 tentacularia (Hermينيا), 207
 tenuiata (Eupithecia), 93
 tereas (Archonius), 229
 testacea (Luperina), 30, 65, 133, 211
 testata (Cidaria), 199
 testudo (Limacodes), 215
 tetradactyla (Acipitilia), 164
 tetradactyla (Alucita), 20
 tetralunaria (Selenia), 65
 tetraquetra (Phlœodes), 116
 Thais, 95
 thaidina (Armandia), 30
 thalassina (Hadena), 160
 thalassina (Mamestra), 207
 thapsiella (Depressaria), 191
 thaumas (Adopœa), 120, 207, 209, 251, 254, 301
 thaumas (Hesperia), 226
 thompsoni (Aplecta), 30, 187, 292
 thymiaria (Hemithea), 200
 tigelius (Pararge), 51
 tincta (Aplecta), 160, 292
 tincta (Mamestra), 208
 tiliæ (Smerinthus), 64, 66, 164, 258
 tiliaria (Ennomos), 181
 Timandra, 7
 tithonus (Epinephele), 87
 typhon (Cœnonympha), 207
 trabealis (Agrophila), 211
 trabealis (Erotyla), 18
 tragoponis (Amphipyra), 65, 158
 transversella (Oxybia), 19
 trapezina (Calymnia), 29, 160, 262
 triangulum (Noctua), 66, 166
 trepida (Notodonta), 63, 64, 66
 Trichanarta, 23
 tridens (Acronycta), 208, 285
 trifasciata (Hypsipetes), 204
 trifasciata (Larentia), 207
 trifolii (Mamestra), 206, 208, 227, 259
 trifolii (Zygæna), 118, 207, 209, 293
 trigeminata (Ptychopoda), 43, 46
 trigrammica (Grammesia), 65, 134
 trilineata (Ephyra), 205
 trilinea (Grammesia), 134
 trilophus (Notodonta), 136
 triplasia (Abrostola), 26, 66, 180, 292
 tripartita (Abrostola), 65, 180
 tripunctana (Pardia), 115
 triopes (Erebia), 247
 trisignaria (Eupithecia), 164
 tristata (Larentia), 202, 204
 tristata (Melanippe), 184
 tritici (Agrotis), 134, 208, 227
 tritophus (Notodonta), 162
 trophonius (Papilio), 28
 truncata (Cidaria), 93, 185
 turca (Leucania), 136, 208
 turfosalis (Tholomiges), 180
 tyndarus (Erebia), 248, 274
 typhæ (Nonagria), 133
 typhon (Cœnonympha), 87, 285
 typica (Mania), 65, 66
 typica (Nœnia), 227
 uddmanniana (Aspis), 115
 uddmanniana (Notocelia), 82
 ulceratalis (Cornifrons), 20
 ulicetana (Caloptria), 116
 ulmata (Abraxas), 182, 239, 261
 ulvæ (Senta), 126
 umbra (Pyrrhia), 209
 umbraria (Boarmia), 82
 umbratica (Cucullia), 65, 180
 umbrosa (Noctua), 134
 unangulata (Melanippe), 94, 204
 unanimitis (Apamea), 291
 unanimitis (Hadena), 208
 uncula (Hydrelia), 207, 287
 undulata (Eucosmia), 185, 204, 315
 unicolor (Canephora), 206
 unicolor (Cirrœdia), 159
 unidentaria (Coremia), 44, 184, 285
 unidentaria (Larentia), 212
 unifasciana (Tortrix), 115
 unifasciata (Emmelesia), 286, 310
 unifasciata (Larentia), 212
 unipuncta (Lycæna), 226
 urticæ (Abrostola), 26, 180, 238
 urticæ (Aglais), 259, 285
 urticæ (Spilosoma), 30, 90
 urticæ (Vanessa), 25, 50, 117, 259, 163, 210, 260, 262, 280, 281, 311
 urticana (Sericoris), 115
 urticata (Eurrhypara), 30
 vaccinii (Orrhodia), 192
 valesina (Argynnis), 50
 valligera (Agrotis), 134
 varia (Melitæa), 248
 variata (Larentia), 205
 variata (Thera), 184
 variegana (Peronea), 115
 variegata (Gnophos), 18
 varleyata (Abraxas), 262
 vauaria (Halia), 182
 vaupunctatum (Orrhodia), 227
 veleda (Junonia), 186
 velleda (Hepialus), 108, 163
 venosata (Eupithecia), 94, 183, 287
 venosata (Tephroclystia), 183
 venustula (Erastria), 207
 verbasci (Cucullia), 82
 verberata (Larentia), 212
 vernaria (Geometra), 65, 68

- vernetensis (*Melitæa*), 244, 301
 versicolor (*Endromis*), 202
 vespiformis (*Sesia*), 113
 vestigialis (*Agrotis*), 80, 134, 211, 227
 vetulata (*Scotosia*), 209
 vetusta (*Calocampa*), 160, 202, 227
 vetustus (*Heliconius*), 317
 v-flavum (*Enophila*), 262, 320
 viardi (*Perrhybris*), 229
 vibicaria (*Rhodostrophia*), 209, 226
 viciella (*Psyche*), 206
 villica (*Arctia*), 19, 82, 89, 216
 vinetuncula (*Miana*), 292
 vinula (*Dicranura*), 64, 109, 287
 virgaurea (*Chrysoph.*), 31, 209, 226, 246
 virgaureata (*Eupithecia*), 183
 virescens (*Hepialus*), 318
 virgularia (*Acidalia*), 18
 virgularia (*Ptychopoda*), 43, 46, 47
 viridana (*Tortrix*), 115
 viridata (*Nemoria*), 200
 viridaria (*Larentia*), 80, 183
 viridaria (*Phytometra*), 63, 180, 210
 virens (*Luceria*), 227
 virgularia (*Acidalia*), 285
 vitalbata (*Phibalapteryx*), 184
 vitelina (*Leucania*), 136, 287
 vittata (*Larentia*), 209
 vulgata (*Eupithecia*), 67, 184
 w-album (*Thecla*), 22, 216, 294
 wavaria (*Halia*), 182
 wavaria (*Thamnonoma*), 212
 westwoodii (*Eurema*), 229
 wheeleri (*Lycæna*), 94
 wockearia (*Dasydia*), 139
 xanthodippe (*Argynnis*), 123
 xanthographa (*Noctua*), 126, 227
 xerampelina (*Cirrhædia*), 65, 66, 159, 163, 262, 314
 xuthus (*Papilio*), 122
 yamamai (*Antheræa*), 129
 ypsilon (*Agrotis*), 30, 237
 zephyrus (*Lycæna*), 248, 275
 ziczac (*Notodonta*), 65, 94, 261, 262, 280
 zægana (*Xanthosetia*), 127
 Zonosoma, 7

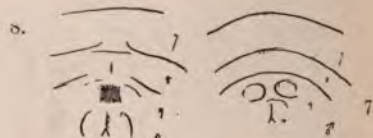
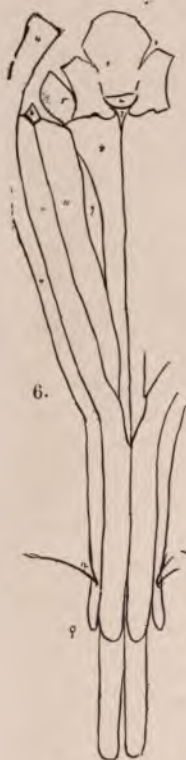
NEUROPTERA.

- ænea (*Cordulia*), 179
 albicorne (*Odonotocerus*), 297
 annulatus (*Cordulegaster*), 179, 296, 297, 310
 armatum (*Agrion*), 162, 179, 189
 aspersa (*Chrysopa*), 297
 azurea (*Mystacides*), 297
 barbara (*Lestes*), 298
 braueri (*Leptocerus*), 298
 cærulescens (*Orthetrum*), 296, 297
 cancellatum (*Orthetrum*), 179
 centralis (*Limnophilus*), 298
 coccajus (*Ascalaphus*), 297
 cognata (*Panorpa*), 95
 communis (*Panorpa*), 95
 cyanea (*Æschna*), 91, 179, 288, 313, 314
 cyathigerum (*Enallag.*), 91, 178, 179, 314
 depressa (*Libellula*), 178, 179, 296, 297, 310, 314
 dryas (*Lestes*), 314
 elegans (*Ischnura*), 91, 110, 179, 296, 297, 298, 314
 elegans (*Limnophilus*), 288
 flaveolum (*Sympetrum*), 310
 formicarius (*Myrmeleon*), 298
 fuliginosa (*Sialis*), 298
 fusca (*Sympycna*), 297, 298
 galleatum (*Sericostoma*), 297
 germanica (*Panorpa*), 95
 grandis (*Æschna*), 91, 179, 189, 314
 hæmeroidalis (*Calopteryx*), 297
 hirtus (*Megalomus*), 298
 imperator (*Anax*), 30, 179, 298
 inconspicuus (*Hemerobius*), 298
 infuscans (*Ischnura*), 299
 isosceles (*Æschna*), 179
 juncea (*Æschna*), 179, 296, 310
 latipes (*Platynemis*), 298
 longicornis (*Ascalaphus*), 298
 lutescens (*Hemerobius*), 297
 mercuriale (*Agrion*), 30, 310
 meridionalis (*Dilar*), 298
 meridionalis (*Panorpa*), 297
 meridionalis (*Sympetrum*), 298
 minium (*Agrion*), 296
 mixta (*Æschna*), 24, 30, 91, 313
 naias (*Erythromma*), 91, 179, 314
 nymphula (*Pyrrhosoma*), 91, 178, 296, 297, 314
 pennipes (*Platynemis*), 30, 179, 298
 pratense (*Brachytron*), 297
 puella (*Agrion*), 91, 178, 314
 pulchellum (*Agrion*), 91, 179
 pumilio (*Ischnura*), 30, 288
 pyrenaicum (*Sericostoma*), 298
 quadrimaculata (*Libellula*), 178, 179, 310
 rufescens (*Ischnura*), 299
 scoticum (*Sympetrum*), 179, 310, 313
 selysi (*Sericostoma*), 298
 simillimus (*Gomphus*), 297
 splendens (*Calopteryx*), 179
 sponsa (*Lestes*), 91
 striolatum (*Sympetrum*), 91, 179, 296, 298, 313, 314
 tenellum (*Pyrrhosoma*), 178, 179
 ventralis (*Chrysopa*), 95
 virgo (*Calopteryx*), 179, 296, 298
 vulgaris (*Rhyacophila*), 297
 vulgata (*Libellula*), 296
 vulgatissimus (*Gomphus*), 30

ORTHOPTERA.

- Ædipoda*, 261
ægyptium (*Acridium*), 69, 95
albipennis (*Apterygida*), 266
americana (*Blatta*), 267
annulipes (*Anisolabis*), 266
arachidis (*Apterygida*), 189
arachidis (*Chelidura*), 266
auricularia (*Forficula*), 266, 318
australasiæ (*Blatta*), 267
bicolor (*Stenobothrus*), 139, 268
cinereus (*Thamnotrizon*), 268
elegans (*Stenobothrus*), 268
germanica (*Phyllodromia*), 267
grisea (*Platycleis*), 268
grossus (*Mecostethus*), 268
holosericea (*Nyctibora*), 69
lesnei (*Forficula*), 267, 288
lineatus (*Gomphocerus*), 268
maculatus (*Gomphocerus*), 268
media (*Apterygida*), 266
orientalis (*Blatta*), 267
panzeri (*Ectobia*), 288
parallelus (*Stenobothrus*), 268
peregrina (*Schistocerca*), 69
pubescens (*Forficula*), 288
quadripunctata (*Phaneroptera*), 317
riparia (*Labidura*), 267
rufipes (*Stenobothrus*), 268, 284
rufus (*Gomphocerus*), 268
surinamensis (*Leucophæa*), 92, 111, 119,
 267
sylvestris (*Nemobius*), 268
varium (*Meconema*), 268
viridissima (*Locusta*), 261, 283
viridulus (*Stenobothrus*), 268





THE ENTOMOLOGIST

VOL. XXXVIII.]

JANUARY, 1905.

[No. 500.]

THE EARLIER STAGES OF *CATACLYSTA* *LEMNATA*, L.

By T. A. CHAPMAN, M.D.

(PLATE I.)

ON June 4th, 1904, being at Bookham with the South London Entomological Society, I observed *C. lemnata* in some abundance, and remembering that it was the only one of the Hydrocampas (except *Acentropus*) with whose early stages I had no acquaintance, I took home a supply of moths, with a view to obtaining eggs.

Curiously enough, I found, on looking into the matter, that all the other species had been well reported on by various authors, but I could find nothing better about *lemnata* than that by Buckler, who tells us nothing of its history earlier than Nov. 10th, when it is beginning to think of hybernation.

The way in which *lemnata* lays her eggs interested me perhaps as much as anything in its history. It lays them under water, and that surface of the egg which in the case of nearly all Lepidoptera is exposed to the air, is in that of *C. lemnata* bathed in water. This fact has never been recorded of *C. lemnata*, but it has been, I think, of all the other Hydrocampas; *A. niveus* (female) appears to go under water to do so, but the others apparently only submerge their ovipositors. The curious fact that all these eggs are truly aquatic is one that I had never clearly understood, probably because attention has not been called to it in records; for example, Buckler (E.M.M. xiv. p. 97) records how Mr. W. E. Jeffrey got *H. stagnata*, Don., to lay eggs, which he found placed in little batches on the under side of floating pieces of *Sparganium*. Not being pointedly told that the eggs are in the water and wetted by it, one reads the fact along with the accounts, which are much more abundant, of how

the *larvæ*, though under water, keep themselves surrounded by air, and supposes the eggs are afforded some similar method of aeration.

Ritsema, in stating how *Acentropus* lays her eggs, says they are under water, but does not say they are wet, which nevertheless they doubtless are.

My notes say that the moths, taken June 4th at Bookham, were kept in a glass, with various leaves and some *Lemna*, with water at the bottom. Eggs are found June 6th, laid in two different manners. In the one case they are laid on leaves of *Lemna triclea*, and are wholly submerged—one surface of the egg attached to the leaf, the other free in the water. These eggs are laid close together, but not overlapping—generally several together, and in one case covering the whole surface of a leaf—reaching the number of twenty-three. The other method of laying affected about a score of eggs, and the eggs were in batches of about three, and in one case six, together. These floated freely on the surface of the water, the lower surface being in the water and wet, the upper above water and dry. This upper surface was coated with a pavement of the scales of the moth, laid over the whole of each batch in one uniform direction, the stalks of attachment in one direction, the serrated margins in, of course, the opposite; but all parallel, and apparently close together or overlapping. When the eggs did not seem quite in the same direction, the scales were nevertheless so, and seemed to be what held the eggs of each group together, and also what kept the upper surface dry, the scales not apparently being capable of getting wet.

The eggs are very flat, almost scale-like, of oval outline, about 0.75 mm. long and 0.56 across. The contents yellowish, and in some cases already showing structure, there being a notch at one side in the yellow mass, from which a groove appeared to nearly cut off a central circular portion.

June 15th.—Larvæ very nearly fully developed; a tortuous tube is visible, no doubt the tracheal trunk of side nearest observer.

16th, 11 a.m.—The larvæ (and eggs) are now very conspicuous, owing to the head and prothoracic plate, which occupy so large a part of the top of the egg, being black; the clypeus is paler, and the jaws, which stand forward prominently, are brown. The eggs look thicker and more rounded, as if by imbibition of water, but this may be merely a perspective effect of the change of colour. No measurement seems available.

June 16th, 5 p.m.—Some larvæ found hatching, and some have already done a good deal in the way of clothing themselves. Their heads, including the clypeus, are now very black. They creep out of the eggs in the ordinary way, and walk off along the leaf on which the egg is laid; in doing so they are in the

water, are quite wet, and seem quite at home. They cut out irregular portions of leaf of *L. trisulca*, and get between the loose bit of leaf and the remaining portion. So far there is nothing that can be called a case, *i.e.* a movable case, and no larva is yet in a tube, or anything of that sort, but is between two flat surfaces, or sometimes three. One larva under *L. minor* had cut up the short radicle into three or four pieces rather more than his own length, and had fastened them together irregularly. All the larvæ that had done anything, and some that had not, had already green matter in the alimentary canal, and it seems certain that portions of plant are cut off by eating the material along the dividing line.

9 p.m.—One of the floating eggs has hatched, and the larva has reached a bit of duckweed; his procedure was not observed, but he did not come out on top; so that the clothed face of the egg is the face of attachment, not the free one, as in such ova as *cæruleocephala*, *lanestris*, &c.

There can be little doubt that the eggs are attached to the duckweed by the same face as that covered by the scales in the floating ones. One face of the egg is in the water, the other attached to something. The eggs on the duckweed could no doubt obtain a supply of oxygen from the green plant, the floating eggs from the air, but I incline to think that in both cases breathing takes place by the wet surface, which is the exposed active surface in all other similar eggs; and were it not so, eggs laid, as must frequently occur, on bits of floating dead vegetation, whether bits of wood or dead *Lemna*, would be unable to respire. I wondered a good deal about the floating eggs. How were they laid, and how were they coated with scales? I came to the conclusion that they must be laid by the moth on her own body, and in some way detached, as she has no apparatus for coating eggs with scales. No doubt laying the eggs under water on leaves of *Lemna* is the usual and proper way of laying the eggs. Were the floating eggs the result of some accident by which the moth laid the eggs on herself, or on another moth (there were several in the jar)? Against this supposition is the fact that the eggs got detached from the surface of the moth, suggesting that it was a normal process, and still more especially that the eggs thus laid, under a layer of scales floating on the water, got on in every respect as well as those on the *Lemna*.

June 17th, 8 a.m.—All the floating eggs have hatched, and the young larvæ are on the bits of duckweed, against which they floated. Two have eaten so far into leaves of *L. minor*, that they can be distinguished from the upper side through the thinned centre of the leaf.

The larvæ in their shelters are still in the water; they have

not surrounded themselves by an air-cavity in a case, or any such arrangement. Two larvæ are found mining in the middle of the thick parenchyma of leaves of *L. polyrhiza*, without any indication that they are not completely wetted by water and sap.

June 16th.—In handling the newly-hatched larvæ, to place them separately, and in positions in which their proceedings may be observed, it is seen that the larvæ are completely wet, but when brought out of the water they become largely dry, but immediately get wet on being placed in the water again. The amount of protection and the manner of it seems not very different from that of the upper surfaces of the leaves of *Lemna* (except *trisulca*). When submerged these became quite wet, but, reaching the surface, the water leaves them, as though they were slightly greasy, and in a way to force the leaves to the surface in a proper position, as soon as one bit reaches the surface. The under side, on the other hand, is always wet, and carries a layer of water with it when taken out. Neither the *Lemna* nor the larva carries with it a coating or layer of air, as is the device of many surfaces that repel water. At the same time a floating larva creeps away under a leaf without any obvious effort, whilst some force is necessary to submerge an upper surface of *Lemna* leaf; so that, though the water-repulsion of both seems of much the same character, it is weaker in the case of the larva.

June 18th.—Larvæ all in cases, of all sorts of sizes and shapes; sometimes all the pieces are cut off, and the cases are portable; sometimes one side is the under surface of a large leaf of *Lemna*, and the case is a fixture. The pieces are of irregular shape, roughly triangular, &c., often as broad as long, so that no sort of larva-shaped case results. These irregular shaped pieces are also of various sizes, down to small corners of leaves, often sections of rootlets, &c. It is in fact somewhat erroneous to call them cases; they are really shelters, manufactured as rapidly as possible from the available materials. The little larvæ also appear to eat freely.

19th.—Examined several cases, and found that they contained no air—that the larva lived bathed in the surrounding fluid; the simplest way to verify this was found to be to open the case under water, when no air at all was found.

22nd.—Several cases examined; the larvæ were found to be in their second stages, and the cases now contained air. The head is pale, with a faint dusky tinting; the prothoracic plate is large and very black, anal plate not tinted, and looks as if of same texture as rest of larva. The larva is full 2 mm. long, rather thick, large head, of fairly uniform thickness throughout (0.3 mm.). The hairs are now (comparatively) much shorter (II=0.08 mm.); they are one to each tubercle, which are now

large oval convex scuta, with the hair central (about 0.04 mm. in diameter); I is about half the length of II; IV, V have a common scutum, posterior hair higher; VI, single hair, and 3 at base of proleg. On thorax 1 and 2, I, II, III and IV (?) have each two hairs.

In preparing a skin, the silk gland was broken against the glass, and the contents almost immediately afterwards were found to have glued the specimen to the glass, although under water.

June 27th.—Opened two cases; found the larvæ of two different ages, one (in second skin?) pale and distended, and nearly as large as the other (in third skin), with larger head, looking collapsed and nearly black; when stretched out it was very much paler; length about 3 mm.

July 2nd.—Two larvæ have gone much ahead of the others, and are very large, possibly in last skin, certainly in penultimate.

Left a number of larvæ in a multitude of glasses on *July 4th*. They were soon reported to be very voracious. Just before *July 12th and 13th* had fastened themselves to sides of glasses, and were supposed to be pupating, but they cut themselves free, and were therefore supposed to have been moulting; they were now in need of much fresh duckweed, as they were very voracious. They then pupated without calling any special attention to the procedure, and on *July 22nd* two moths emerged. On the 25th seven came out, and many had emerged since 22nd. On 27th all appeared to have emerged. On Aug. 10th, however, another appeared, and on 12th there were found to be still three larvæ feeding. Whether these were laggards, or intruders introduced small with the relays of duckweed, must remain in doubt; one was preserved, one emerged (a male) Sept. 1st, and one was then still feeding. This one was still alive in November, and apparently hybernating.

The cocoon is of much denser (very white) silk than the larva-case, though made within it (or of it), and on the emergence of the moth seems almost at once to lose its water-resisting property.

My larvæ were clearly double-brooded, but, as they were kept indoors, and in (comparatively) small glass vessels exposed to the sun whenever it shone through the window, this part of my experience cannot safely be extended as applying to the insect in its native ponds.

(To be continued.)

NOTES ON THE WAVE MOTHS (GENUS *ACIDALIA*,
Auct.)*

By LOUIS B. PROUT, F.E.S.

IN the above title I have retained the name "*Acidalia*," to which the moths of which I want to speak have been so generally referred; but there are two objections to it, and I am only using it as a recognizable appellation, not as a tenable genus. In the first place, most modern authors consider it "preoccupied" by *Acidalia*, Hb. Verz., p. 31, and it is just possible that was really published before *Acidalia*, Tr. And in the second place, even if the Geometrid genus (*Acidalia*, Tr.) has really the prior claim to the name, its true type should evidently be *brumata*, Linn., according to the diagnoses of Schiffermüller (Fam. K.) and Treitschke.

The so-called genus "*Acidalia*" is somewhat nearly related to the subfamily which is generally considered typical of the entire superfamily Geometrides, namely the subfamily Geometrinæ, or "emerald moths." The name of "wave moths," given by our old English writers, is due to the pattern of the wings, which is of a tolerably uniform type almost throughout them, consisting of a succession of waved dark lines traversing both pairs of wings, though a few species modify the pattern, *e. g.*, by blotches, especially behind the outer line. Unfortunately, however, this is a rather general—probably primitive—type of marking in the Geometrides, and the terribly superficial classifications of our entomological forefathers, being based upon mere wing-markings, suffered in consequence. Thus Hübner (Verz. bek. Schmett. pp. 308–12, circ. 1825), the first to attempt any elaborate subdivisions, created one stirps for practically the whole of the wave-marked species, giving the stirps, for no very obvious reason, the name of *Sphecodes*—"wasp-like"; he diagnoses it thus: "Body very slender, wings ample, that without markings, these marked with waved lines"—a fair sample of the classificatory characters which satisfied the old lepidopterists. As may be imagined, the genera in this stirps or family were sometimes decidedly mixed as to their contents; thus, *Leptomeris* comprised *exanthemata* and some true Acidaliids, *Asthenes*, *candidata*, *luteata*, and some true Acidaliids, and so on. This is neither better nor worse than our vernacular, in which *exanthemata* is the "dingy white wave," *candidata* the "small white wave," and so on. Even so recently as 1857 the French systematist, Guenée, retained the genus *Asthenes* (*candidata*, &c.) in his Acidaliidæ, and considered that his Caberidæ (*exanthemata*, &c.) also had considerable affinity with them. But his views

* Read before the North London Natural History Society, November 22nd, 1904.

were already a little "behind the times" even when he wrote; for his German contemporaries, Speyer, Herrich-Schaeffer, and Lederer, had for some years been investigating classification upon more of an anatomical basis—leg-structure and neuration in particular—and had published much which showed that the genera in question belonged to three very distinct groups, and this seems fully borne out by studies of the early stages. *Asthena* belongs to the Larentiidae (commonly called "carpet moths") rather than to the "waves," while *Cabera* has the essential characteristics of the great family Boarmiidae, including true *Boarmia* (the "oak beauties," &c.), the Fidoniinae ("heath" moths, &c.), and many others. These, therefore, lie quite outside the range of the Acidaliæ, and I shall dismiss them from consideration.

I have just said that Guenée—whose work has constantly to be referred to because it is the basis of Doubleday's and South's arrangements, so largely used by British workers—that Guenée wrongly includes *candidata*, &c. (Astheninae) in his family Acidaliidae, and a glance at South's List will show you that the elimination of these reduces the family by six—four species of *Asthena*, *Eupisteria obliterata*, and *Venusia cambrica*. But it so happens that, by way of compensation, six species which Guenée placed in a different family immediately before Acidaliidae, namely, his Ephyridæ, have certainly to be incorporated therein. No one can have noticed the ova or, the imaginal characters of *Zonosoma (Ephyra)*, without seeing how near they come to the "Waves," and even the highly specialized, butterfly-like pupa has clear affinities with the pupa of "*Acidalia*." Probably, however, that compact little group can still stand as a subfamily, Ephyrinae, leaving us to deal with the *typical* subfamily Acidaliinae (Sterrhinae) or "Waves" proper. By an absurdly antiquated arrangement, all of these which are represented in Britain, with the single exceptions of the "blood-vein moth" (*Timandra*) and—in some authors—the beautiful little *muricata (Hyria)*, are still allowed to stand as one genus (*Acidalia*), not only in our British lists, but also in Staudinger and Rebel's recent 'Catalog' of the Palearctic Lepidoptera. There is no doubt still much work to be done in investigating the closer affinities of one species with another, but the fact that they represent at least three distinct biological groups has been recognized by the best workers for fully half a century, and the genera which Herrich-Schaeffer formed from the anatomy of the imago are supported, so far as research has yet proceeded, by marked larval distinctions, and I believe by those of the egg also. Probably, however, even the three genera will prove inadequate when the larvæ have been more thoroughly worked through.

The only English text-book which has yet shown us these three main "genera" is Meyrick's 'Handbook of British Lepidoptera' (London, 1895). He calls the genera in question *Eois*,

Sterrha, and *Leptomeris*,* only *ochrata* going to *sterrha*. I shall speak more particularly of the two larger genera presently; of the early stages of his *Sterrha* I know practically nothing, excepting that the larvæ seem somewhat intermediate in form between those of the other groups, and that Mr. Tutt notes distinctive egg characters. In Buckler's 'Larvæ of British Butterflies and Moths' (vii. p. 82) is the astonishing italicized statement that "its (the larva of *S. ochrata*) ventral pair of legs is on the eleventh segment," which, in modern nomenclature, would be the seventh abdominal; if there is not some error of observation, this distinction would be of far more than generic value, but I confess that I can hardly credit the statement. I ought to mention here that Herrich-Schaeffer founded yet a fourth genus upon imaginal leg-structure for *A. fumata*, naming it *Pylarge*, and that Meyrick has accepted this in his 'Handbook'; but the larva seems, from all accounts, so near those of *immutata* and *remutata*, that I doubt whether it could not better have been allowed to rest in *Leptomeris*, as in Meyrick's 1892 'Classification' (Trans. Ent. Soc. Lond.).

A few other attempts to isolate aberrant species of "*Acidalia*" may be very briefly mentioned. *Immorata*, with its warmer and rougher scaling, tessellated fringes, and less characteristically "waved" pattern, was placed by Guenée in *Strenia*, along with *clathrata*; but this was entirely erroneous. *Emarginata*, on account of its peculiar shape, had a special genus, *Ania*, erected for it by Stephens long ago, and this is followed by Barrett in his new book, and will probably prove worth adopting. Barrett also ('Lep. Brit.' viii. p. 72) uses *Timandra* (wrongly, of course, as the name belongs to *amata*) for the species which have the hind wing angulated; they can probably for the present remain as a section of Meyrick's *Leptomeris*. *Rusticata*, being our only British wave with a "carpet band" (i. e., darkened central band) originally got placed among the Carpets, and Stephens in his 1850 Catalogue maintained it as a separate genus under the name of *Cosmorhoë*, Hb.; Hübner himself ('Verzeichniss,' p. 326), had somewhat mixed contents for his *Cosmorhoë*, namely, *galiata*, *ocellata*, *rusticata*. The question of the exact position of this charming little species (*rusticata*) is a somewhat difficult one; but it has long been recognized, and is beyond the possibility of cavil that it is a true "*Acidalia*" in the broad sense in which I have used the term in the title of my paper this evening. Its larva is one of the stout and rugose ones with stiff, clubbed bristles, and would belong very well with *interjectaria*, &c., in *Ptychopoda* (=

* *Eois*, as Moore and Warren have pointed out, rightly belongs to *russearia*, Hb., and this genus should be called *Ptychopoda*, Steph. Meyrick's other names seem historically correct. Warren and Swinhoe have recently substituted *Emmiltis*, Hb., for *Leptomeris*, but Herrich-Schaeffer's prior restriction makes *pygmaearia*, Hb., the type of *Emmiltis*, which is hence a quite distinct genus.

Eois, Meyr.), in which genus, indeed, Meyrick places it. But his genus rests on imaginal characters alone, amongst the chief of which is, "posterior tibiæ in male . . . without spurs"; whereas those of *rusticata* most emphatically have the terminal spurs, and well developed. This circumstance has led Herrich-Schaeffer to place it in the genus which Meyrick calls *Sterrha*, along with *ochrata*, &c.

I am afraid I shall have wearied you already with these intricacies of the imaginal classification, but I thought it almost necessary to state how matters stood in that regard, in order to be able to compare one or two of the results arrived at with those obtainable from the earlier stages, which have been, in this group, too much neglected from the systematist's point of view, but which I am hoping to take in hand as opportunity offers; and concerning which I want to show that I have already made a commencement. To be sure, I cannot claim to have yet discovered anything novel, and the peculiar hair-structures of certain of the larvæ have been mentioned in a haphazard way by different writers, as have also the extreme differences in the relative length and thickness in various members of the group; but, so far as I am aware, no attempt at all has been made to correlate the imaginal genera with the larval. This, no doubt, arises from the fact that our genus-makers are chiefly museum-workers, who know nothing, and care less, about the earlier stages; for instance, the celebrated Dutch entomologist, Heer P. C. T. Snellen, who not so long ago remarked, very inaptly, that it seemed to him that the classifying of insects by any other than the perfect state was very much like classifying men and women by the shape of the cap which their grandmothers wore! Surely the nearest approach which can be made to a *perfect* classificatory system will be made by those who—like Mr. Tutt and his collaborators in his great work, 'British Lepidoptera'—endeavour to take due account of *all* stages, and *all* characters, of course with an adequate recognition of their probable relative antiquity and stability, and so forth, under the stress of the manifold operations of natural selection.

In speaking of the larvæ of "*Acidalia*," let me first mention some peculiarities of habit, &c., which are more or less distinctive of them, and which may readily attract the attention of even the casual observer. I do not quite know how best to arrange these scattered observations; but perhaps the following will satisfactorily cover the ground, *viz.*: *when* they are found; *where* they are found; *how* they feed; *how* they are protected. In one sense, at least so far as my own experience is concerned, the first two might almost be disposed of in single words—"nowhen" and "nowhere." During a period of some eighteen years as a more or less active field-lepidopterist, I have only on four occasions, to my recollection, found an "*Acidalia*" larva, and in each

instance by the purest "fluke." Many years ago I remember meeting with a full-grown caterpillar of the common "riband wave" (*Ptychopoda aversata*) crawling on a tree-trunk in Epping Forest, probably searching for a place in which to pupate. And thrice more recently, when prying about amongst a mixture of low-growing plants on rough broken ground, such as that around the "Limpet Run" at Sandown, I have happened upon a larva which has been successfully bred, the three species being *P. interjectaria*, *Leptomeris imitatoria*, and *L. marginepunctata*. Yet all these four species, and several others in the genus, are really quite common—either everywhere, as in the case of *P. aversata*, or locally, as in that of the other three. Hence it is pretty clear that their small size and retiring habits—the latter including the fact that they all, or nearly all, feed upon insignificant growths close to the ground, shield them sufficiently from human observation; and were it not that the eggs are easy to obtain from a captured female, and the larvæ not hard to rear, we should probably know comparatively very little about their early stages. It is only right to add, however, that a few entomologists, such as Dr. Rössler, of Wiesbaden, seem to have been exceptionally gifted at finding obscure larvæ in their native haunts, and have given us records of the habits and habitat of quite a respectable number of the species.

If, however, I cannot say much about *when* the larvæ are "found," I can tell you definitely *when* they are, or theoretically should be, *findable*. And this is throughout ten or eleven months of the year—almost any time, excepting, say, June or July (when practically all the imagines are out). For this is a genus, or group, of clearly-defined habit as regards the general course of its life-cycle. I remember hearing my friend Mr. Bacot tentatively suggest a fixed hybernating stage as a possible generic character—*i.e.*, mark of close phylogenetic relationship—in certain cases amongst the Lepidoptera. Of course neither he nor I would overpress it; for it is well known that sometimes the very closest allies differ in this respect, so that it would even seem as though the physiological isolation which formed them into species were actually due to an initial divergence in the hybernating habit; *e.g.*, *Cidaria immanata* passes the winter as an egg, its twin brother *C. truncata* as a larva. But it is none the less true that several thoroughly natural groups have maintained complete uniformity, so that we find all the *Acronyctæ*, all the *Dianthæciæ*, &c., hybernating as pupæ, all the great genus *Agrotis* as larvæ, and so on. Now our '*Acidalia*' seem absolutely incapable of hybernating in any other state than that of caterpillar, and the apparent inflexibility of this rule in so large a group seems at least worthy of mention. I noticed that the Rev. G. H. Raynor commented on the fact in a recent number of the '*Entomologist's Record*' (vol. xvi. p. 108); but, misled by

defective information in some of the books, he thought that *P. perochraria* afforded a possible exception. I find that Rössler, from whom the suggestion was supposed to emanate, gives no hint of anything exceptional in its hibernating period.

(To be continued.)

SOME TASMANIAN CASE-BEARING LEPIDOPTERA.

By FRANK M. LITTLER, F.E.S., M.A.O.U.

(Concluded from vol. xxxvii. p. 315.)

OECETICUS IGNOBILIS, Walk.

♂. 40 mm. Head, thorax, and abdomen brownish ochreous, face whitish, antennæ ochreous, legs fuscous. Fore wings elongate, moderate; costa nearly straight; termen oblique, semihyaline, minutely irrorated with fuscous scales, thicker towards base and along costa. Hind wings with termen rounded, slightly uneven; colour as in fore wings; some dull ochreous fuscous hairs towards base and along dorsum.

♀. 15-20 mm. Apterous. Cream-coloured, except for the head and thoracic segments, which are brownish; surface naked, except for slight pilose fringe of short yellowish hairs on the posterior segments.

What I have remarked about the female of *Clania lewinii* applies with equal force to this species. Therefore there is no necessity to repeat myself. This species is not so plentiful as the previous one; its case is formed in the same manner, but is longer and stouter. Personally, I have found it feeding on eucalyptus only. The habits of the male and female moths are precisely the same as those of *C. lewinii*.

On the mainland this species is commonly known as the "Lictor Case-Moth," because its case bears some resemblance to the fascies or bundles of rods borne by the lictors of old before the Roman magistrates.

CEBYSA CONFLICTELLA.

♂. 14-19 mm. Fore wings very deep brown, black in some lights, powdered with minute golden scales; along the costa are five orange-yellow spots at practically equal distances apart; the first spot is just inside the apical angle, and the fifth at the base of the wing; the fringes are likewise orange-yellow. Hind wings same colour as fore, but with more orange-yellow markings; discoidal cell orange-yellow, also apical angle, but this yellow spot is absent in some specimens; the inner margin has four orange-yellow spots; fringes orange-yellow. Under side same as upper. Body very dark brown, tufts on side of thorax pale yellow; under side of abdomen orange-yellow.

♀. 11-15 mm. Semi-apterous. Fore wings a beautiful shade of peacock-green; apical area orange-yellow, extending one-fourth; two

orange-yellow spots on costa; fringes yellow. Hind wings: apical half orange-yellow, basal half peacock-green, with a small orange-yellow spot on inner margin; fringes yellow. Body: upper and under sides peacock-green. Legs same colour. Body often projects 6 mm. beyond the hind wings.

This species is fairly common in parts. The males during February and March may often be seen hovering about fences, especially on any very warm day. They are very rapid and erratic flyers, somewhat difficult to capture. This last summer they were more numerous than usual. The females, on emerging, crawl on to a post or a bough, and are there impregnated by the males. They cannot fly in the least, but can run very fast, with a curious ant-like motion. When approached they immediately run round the post or bough, and hide in some crevice. Very few females are seen in proportion to the number of males; this is perhaps owing to their shyness. The posterior extremity is elongate, and the ovipositor is sheathed in long fuscous hairs. Eggs dull milky white, no sign of any markings even under high magnification, inclined to oval in shape. They are laid singly on or in close proximity to their food-plants, which consist of grasses and many species of garden-plants; also members of the acacia family. The larvæ are, as is usual with many species of case-moths, pale yellowish white, with the head and thoracic segments chitinous, and marked with black. The cases are 15 mm. long by 5 mm. broad, and are composed of silk incrustated on the outside with minute fragments of bark; no twigs are employed in their structure. They are flattened, being not more than 3-4 mm. deep. The under sides of fence-rails is a favourite locality for them, as are also the crevices in the bark of old acacia-trees. The larvæ reverse in the usual manner before emerging from the lower end.

LEPIDOSCIA MAGNELLA, Walk.

♂. 25 mm. Head yellow, face fuscous; thorax, antennæ, legs, and abdomen dark fuscous; thorax yellow anteriorly. Fore wings elongate, moderate, dark fuscous, markings yellow; a diffused spot on inner margin; a moderate straight fascia from before middle of costa to before middle of inner margin; a triangular spot on costa at four-fifths; a smaller spot on inner margin before anal angle; a spot on termen below middle. Hind wings dark fuscous; basal third ochreous yellow.

♀. 12 mm. Apterous. Ochreous brown. Round the ovipositor is a dense tuft of hair, yellowish brown on surface, pale yellow at tips, 1.5 mm. long.

The cases of this species are often very plentiful in gardens, especially on apple-trees. They are both curious and interesting, being composed of seven, sometimes eight, segments, each formed by regular narrow strips of wood, 5 mm. long, laid on in a slight spiral. The cases are cylindrical, or rather cannon-shaped,

somewhat narrow, broadest at base, and gradually tapering to apex; up to 40 mm. in length, and 4 mm. at greatest breadth.

I have caught but one male moth; it was very weak on the wing. The others I have bred. The female is quite destitute of wings, and is a very sluggish crawler. She never strays far from her case, but remains an inconspicuous object on a bough of its food-plant until impregnated. Then an occurrence takes place which I am at present at a loss to thoroughly understand. On cutting open a number of cases, I have found eggs sprinkled in them from top to bottom. These eggs, on hatching, have proved to be those of this species. Does the moth, after impregnation, thrust the projecting pupa-case out of the way at the posterior aperture, crawl inside, lay her eggs among the silk lining of the case, crawl out again, and then die? Taking into consideration the behaviour of the female of *Clania lewinii*, such a thing is quite possible. On no occasion did I find the remains of a female in any of the cases.

At present I see no other explanation possible to account for the eggs getting inside the cases. They are round in shape, and of a yellow colour. The larvæ on first emerging are 1 mm. long, thorax and abdomen yellowish, and the head black. From actual observations I found that the first case is made exactly in the same manner as that of *C. lewinii* or *O. ignobilis*. The full-grown larvæ are 15 mm. long and 1.5 mm. broad; head and thoracic segments striped with reddish brown, abdomen yellowish white, legs dark brown. Their food-plants consist of a number of species of native trees, including the acacia and Casuarineæ. Sometimes they become very destructive in fruit-gardens by nibbling through the young shoots on apple-trees. The moths are to be found during February and March.

XYSMATODOMA ADELOPSIS, Meyr.

♂. 25 mm. Fore wings blackish brown, dusted with fine silvery scales; running from costa to inner margin are fine interrupted lines of black. Hind wings black, almost purple in some lights; fringes same colour. Head and thorax covered with moderately long silvery hair; abdomen brownish black.

♀. 35 mm. Fore wings blackish brown, well dusted with fine silvery scales; wavy black markings not so pronounced as in male. Hind wings dull blackish brown; fringes tinged with purple. Head grey and thorax black; abdomen blackish brown.

In some districts the cases of this species are rather plentiful on their favourite food-plant, acacia, especially *A. dealbata*, the silver-wattle.

Both male and female moths are heavy flyers, especially the latter. The cases are 24 mm. long and 5 mm. at the widest part, tapering off slightly towards the posterior extremity. They are composed of very fine grains of bark, tightly fastened to a

strong silken envelope. But rarely is a fragment of twig used. When about to emerge the pupa-case is thrust well out of the posterior aperture. The moths emerge in February and March.

Other interesting species I hope to deal with at some later date. My best thanks are due to Mr. Oswald Lower, F.E.S., of New South Wales, for very kindly running me out, from material supplied, the descriptions of *Clania lewinii* (male), and *Lepidoscia magnella* (male).

Launceston, Tasmania : August, 1904.

DESCRIPTIONS OF A NEW GENUS AND SOME NEW SPECIES OF EAST INDIAN HYMENOPTERA.

By P. CAMERON.

(Concluded from vol. xxxvii. p. 310.)

CRABRONIDÆ.

CRABRO ELVINUS, sp. nov.

Black; the scape of the antennæ, two-thirds of the pronotum, a small, transverse pyriform mark on the sides near the tegulæ, the greater part of the scutellum, its keels, a line on the post-scutellum, a line down the base of the mesopleuræ, an interrupted line on the base of the third abdominal segment, the front femora, tibiæ, and tarsi, the apical two-thirds of the middle femora, the apex of the hinder broadly—more broadly below than above—and the four hinder tibiæ, yellow. Wings fuscous, the stigma fulvous, the nervures darker. ♂. Length, 9 mm.

Hab. Himalayas.

Head with the front and vertex closely and distinctly punctured, the former more strongly than the latter; the lower part of the front in the centre smooth, shining, furrowed and covered with silvery pubescence and sparsely with long fuscous hairs. Face and clypeus densely covered with silvery pubescence. Mesonotum opaque, closely punctured and covered with long fuscous hair, as are also the scutellums. The metanotal area bears some curved striæ, and is bounded by a curved keel on the sides; the apical slope is deeply furrowed in the middle, and bears some curved transverse striæ. The furrow on the base of the mesopleuræ is wide and deep, and bears eight transverse keels; in front of the yellow line is a curved keel. Above the middle coxæ are four curved keels; there is an oblique keel above the hinder coxæ, and the metapleura is bounded at the apex by a curved keel. The basal segment of the abdomen becomes gradually wider towards the apex where its width is about two-thirds of the total length; the pygidium is bare, closely and distinctly punctured, and is hollowed in the middle; the epipygium is thickly covered with fuscous pubescence. The apex of the radius is rounded.

CRABRO LYSIAS, sp. nov.

Black; the scape of the antennæ, an interrupted line on the pronotum, and two large transverse marks on the second and fourth abdominal segments, yellow; the greater part of the front tibiæ, the middle at the base and apex, the hinder, except in the centre behind, and the basal joint of the hinder tarsi, yellow. Wings hyaline, the stigma fulvous, the nervures darker. ♀. Length, 9-10 mm.

Hab. Himalayas.

Clypeus thickly covered with dark silvery pubescence, and distinctly keeled in the centre. Mandibles punctured strongly, but not closely at the base; the apical teeth equal in size, large. Front and vertex closely, rugosely punctured, opaque, more shining along the lower inner orbits. Ocelli in a curve. Mesonotum opaque, closely rugose, a narrow furrow in the centre of the basal half; the punctures on the scutellum run into striæ at the apex. Metanotal area irregularly, closely longitudinally striated; a deep furrow in its centre; the furrow becomes wider towards the apex, and is united to the furrow on the apical slope, which is obscurely transversely striated. The upper part of the propleuræ obliquely striated; below, at the apex, are three stout, oblique keels. The upper part of the mesopleuræ is stoutly striated, the striæ curved; the lower part punctured, the punctures running into striæ; the basal furrow is wide. Metapleuræ obscurely striated. Tibiæ stoutly irregularly spined. The basal half of the pygidium bears large punctures; the apical is smooth, hollowed, narrowed, and keeled laterally; it is fringed with long golden hair.

Comes near *C. argentatus* and *C. bellus* in Bingham's arrangement.

CRABRO MENYLLUS, sp. nov.

Black; the scape of the antennæ, except for a brownish line above, an interrupted line on the pronotum and two transverse large marks on the base of the second abdominal segment, yellow. Wings hyaline, the nervures and stigma dark fuscous. ♀. Length, 7 mm.

Hab. Himalayas.

Front and vertex closely and distinctly punctured, the former more strongly than the latter, which is not furrowed, and is covered below with silvery pubescence. Ocelli in a curve. Clypeus not keeled or furrowed in the centre; thickly covered with silvery pubescence. Mandibles black, piceous towards the apex. Mesonotum closely and strongly punctured, and thickly covered with longish pale pubescence. Scutellum closely punctured, less strongly and obscurely striated at the apex; the extreme apex shining. Post-scutellum closely punctured, with a smooth space in the centre. Metanotum aciculated, the base closely striated, the striæ stronger and oblique on the sides; the apical slope aciculated and closely, but not strongly, obliquely striated. Mesopleuræ distinctly, but not very closely, punctured; the meta-closely, finely obliquely striated. Petiole as long as the second and third segments united; it becomes gradually wider towards the apex; the third and following segments are thickly covered with fulvous

pubescence. Legs normal; the fore tibiae with a broad yellow band on the apical half.

This species, from the form of the petiole, is allied to *C. ardens* and *C. odontophorus*. The area on the metanotum is not bounded by a furrow; the furrow on its apical slope is wide and deep on the upper half.

CERCERIS FLAVOPLAGIATA, sp. nov.

Black; the upper part of the head, the mesonotum and scutellum red; the head and thorax largely marked with yellow, the vertex with four yellow marks in a transverse row; the abdomen black, the sides of the first segment, the base of the second broadly, its apex and that of the third, fourth, and fifth narrowly, the lines becoming gradually narrower, two marks, wider than long, on the base of the third segment, the edge of the pronotum behind, the middle of the propleuræ, a mark behind the tubercles, projecting narrowly upwards at the base, an irregular mark on the lower part of the mesopleuræ, the yellow turning into rufous below and two large oval marks on the apex of the metanotum, extending on to the metapleuræ, a mark on the sides of the scutellum and the post-scutellum, yellow. Wings hyaline. ♀. Length, 12 mm.

Hab. Himalayas.

Antennæ rufous, darker above, the scape lined with yellow below. Head: the lower half of the outer orbits, the inner broadly from shortly above the middle, a line extending from the ocelli to the base of the antennæ, dilated below and to a less extent above, the face, clypeus, and the mandibles, except at the apex, lemon-yellow; there is a black line commencing shortly behind the ocelli, where it is obliquely narrowed, extending down the sides of the central yellow line to the base of the clypeus. Occiput black below. Clypeus roundly convex, its apex almost transverse, rufous. The outer marks on the vertex are irregularly oval, the two central narrower, longer, and oblique. The whole head is closely and strongly punctured; the clypeus is less strongly and closely. Thorax punctured, but not strongly, the base of the pronotum shagreened. Metanotal area closely but not very strongly punctured, and more closely on the sides than in the centre. The metapleuræ at the base above with some stout, clearly separated striæ, the lower part and the centre finely, indistinctly striated. Four front legs rufous, mixed with yellow, the coxæ and the femora for the greater part above, black, the middle tarsi black above; the hinder coxæ black, with a yellow line in the centre above, the trochanters for the greater part yellow, the femora for the greater part black, their tibiae broadly black, as are also the tarsi. Petiole stout, of nearly equal width throughout, fully one-third longer than wide. Pygidium longitudinally rugose, of almost equal width throughout; the epipygium with the apical two-thirds incised; the incision becoming gradually, but not much, widened towards the apex. The basal three ventral segments are largely marked with yellow.

In Bingham's arrangement this species would come in near *C. tristis* and *C. sulphurea*.

ANOPLINI.

ANOPLIUS (POMPILUS) ORODES, sp. nov.

Black; densely pruinose; the apex of the hinder femora broadly and the hinder tibiæ red; the wings yellowish-hyaline, the apex from the end of the radius smoky; the third cubital cellule much narrowed above. ♀. Long. 13 mm.

Hab. Darjeeling.

Black; pruinose; the abdomen broadly banded with white pile; the apical third of the hinder femora and the hinder tibiæ red. Head very little developed behind the eyes; the occiput transverse. Eyes parallel, only very slightly converging above. Ocelli in a curve, the hinder separated from each other by a greater distance than they are from the eyes; there is a narrow furrow on the lower half of the front. Apex of clypeus transverse, its sides rounded. Thorax smooth, densely pruinose; the pronotum is as long as the head. Median segment large; the top flat; the apex with an oblique slope, its sides slightly dilated; the outer edges broadly, roundly dilated; below ending in a tooth. The first and third transverse cubital nervures are broadly, roundly curved; the second is straighter and more oblique; the fuscous apical cloud commences at the end of the radial cellule, and does not extend to the third transverse cubital nervure; the third cubital cellule is greatly narrowed above.

Comes near to *P. incognitus*, Cam., but is a larger and stouter insect; has the third cubital cellule not petiolate, the apex of the median segment not thickly covered with silvery matted pubescence, and the wings are not uniformly infuscated. It has the coloration of *P. pedestris*, but it wants the transverse furrow on the second ventral segment found in that species.

OBS.—*P. vischnu*, Cam., has nothing to do with *P. incognitus*, Cam., as Bingham suggests (Hym. of India, 157). It would be much better when an author, in a monographic work, cannot quote a species with certainty as a synonym, to give the original description in full. *Vischnu*, Cam., has the legs entirely black, and has not the hinder femora and tibiæ red, as in *incognitus*. It is related, as I have stated (Manr. Memoirs, 1891, 469), to *P. vivax*, Cam. So, too, on p. 169, *hero*, Cam., is doubtfully referred to *P. rothneyi*. There are considerable differences in coloration between them, and although the two might be sexes of one species, it would have been better, and have saved the student trouble, if the original description had been given in full, seeing that the identity of the two species was so doubtful.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF MALTA.

BY THOMAS BAINBRIGGE FLETCHER, R.N., F.E.S.

(Concluded from vol. xxxvii. p. 319.)

2429. *T. parva*, Hb.—Common; occurs in June and October, and probably throughout the summer. A specimen taken on October 6th, 1903, is ab. *rubefacta*, Mab.

2490. *Emmelia (Erotyla) trabealis*, Sc. (*sulphuralis*, Linn.).—Not common. Marsa; May 16th, 1901, and June 7th, 1902.

2557. *Plusia chalytes*, Esp. One specimen; at light; October 11th, 1903.

2562. *P. gamma*, Linn.—Common from March onwards.

2583. *Metoptria monogramma*, Hb. — Common, but very local. Occurs in grassy places in the wiefs in April and May. Birzebuggia (Mathew); Wied Kratal; Mnaidra.

2818. *Hypena obsitalis*, Hb.—Common in shady places and caves from May to October. The variation is very great.

2820. *H. lividalis*, Hb. — Not common. May 24th, 1902, and November 14th, 1903.

2897. *Eucrostes indigenata*, Vill.—One specimen; October 11th, 1902.

2971. *Acidalia asellaria*, H.S.—“28th March, 1891” (de la Garde). I have a specimen, beaten from *carouba* May 24th, 1902, which I doubtfully refer to this species.

2983. *A. virgularia*, Hb.—“Male, pale form (var. *australis*, Zell.); May 1898 (is not this rather early for ‘gen. aest.?’), Mathew’s coll.” (Prout, Entom. xxxvi. p. 204.)

3032. *A. (Idæa) filicata*, Hb.—One specimen; May 16th, 1901.

3143. *Rhodometra (Sterrha) sacraria*, Linn.—Common from April to October.

3220. *Anaitis plagiata*, Linn.—Common from February to October.

3340. *Larentia salicata*, Hb. *Venusia* sp. (de la Garde). Common in February and March. Maltese specimens rather incline to var. *ablutaria*, Bdv.

3344. *L. fluctuata*, Linn.—“Female, dated 3rd March, 1897; an extremely interesting aberration, the markings being all excessively weak, notwithstanding that the specimen is in immaculately perfect condition—Mathew’s Coll.” (Prout, Entom. xxxvi. p. 204.)

3481. *L. (Camptogramma) bilineata*, Linn.—Common in March and April. Boschetto, Zurricco, &c.; beaten out of ivy, &c. (Mathew).

3658. *Tephroclystia pumilata*, Hb.—Common; February to June. Maltese examples seem intermediate between the northern form and var. *tempestivata*, Z.

3948. *Gnophos variegata*, Dup.—Not uncommon in the early spring. This species is beautifully protected by its coloration when at rest on the rocky sides of the wiefs.

4075. *Aspilates gilvaria*, Fb.—Mr. Mathew (*in litt.*) informs me of the occurrence of this species.

4077. *A. ochrearia*, Rossi. (*citraria*, Hb.).—Common from March to May.

4168. *Phragmatobia fuliginosa*, Linn.—Not uncommon in March. I have found the larva in May, so there is probably another brood which emerges in the summer and oviposits in the early autumn. Maltese specimens seem to incline to var. *fervida*, Stdgr.

4203. *Arctica villica*, Linn.—One crushed larva upon a road near Zurrico (Mathew).

4288. *Cymbalophora* (*Euprepia*) *pudica*, Esp.—Common from July to October. The larvæ are common under stones, in waste places, from January to March; they feed by night on various kinds of grass.

4249. *Euprepia* (*Coscinia*) *striata*, Linn. (*grammica*, Linn.).—One specimen; July, 1897; valley leading down to Birzebbugia (Mathew).

4257. *Utetheisa* (*Deiopeia*) *pulchella*, Linn.—I never met with this species, which appears to be scarce as a rule, but intermittently abundant. There seem to be two (? three) broods, as dates noted are:—May 9th (de la Garde); beginning of August, 1892 (Caruana-Gatto); and October 25th, 1897 (Mathew). Mr. Caruana-Gatto gives us an interesting note on the spasmodic abundance of the species in 1892. He writes (Medn. Nat. vol. ii. p. 239, September, 1892):—"It is worthy of notice that this pretty moth has occurred in unusual abundance this year, and at the moment of writing (August 10th), and for a fortnight past, it has been the commonest moth to be seen on the wing. I do not remember, in fact, ever having had occasion to record such extraordinary numbers of any butterfly or moth. In the open country, and in fields, especially where the *Heliotropium europæum* (on which the *Deiopeia* feeds) grows, it is a most curious sight to see the innumerable quantities of this pretty species, fluttering here and there, looking like large animated snowflakes. Nor is it only by daylight that the moth appears, but also in the night it is found, attracted by the lights. Mr. R. Briffa, a friend of mine, and a gentleman greatly interested in our Lepidoptera, was telling me that at Sliena there were thousands of the species flitting about in every part of the gardens and fields. The same may be said of all other parts of the island, as I have seen the Marsa, Corradino, Notabilo, Attard, and many other places, teeming with this moth and its caterpillar."

"As to the cause of such an unusual frequency, I believe it is to be referred to the rains which fell during the late spring causing an overgrowth of the *Heliotropium*. The extra abundance of this plant . . . may therefore in a measure account . . . for the unusual numbers of this insect."

Psyche sp.—Larvæ are abundant during the spring, and feed on various kinds of grass. The moth appears in August.

4641. *Trypanus* (*Cossus*) *cossus*, Linn. (*ligniperda*, Fb.).—Mr. Mathew notes that he has often smelt the larva of this species. I cannot help thinking that it is of rather doubtful occurrence in Malta, and even then only as a casual importation in trees.

II. 257. *Ephestia calidella*, Gn.—One specimen. April 5th, 1902.

377. *Heterographis convexella*, Led. One specimen. June 14th, 1902.

401. *Oxybia transversella*, Dup.—Two; June 7th and 14th, 1902.

516. *Bradynrhoea cantenerella*, Dup.—Fairly common at the end of May.

825. *Aglossa pinguinalis*, Linn.—“28th March,” 1891 (de la Garde).
 836. *Pyralis farinalis*, Linn.—Common from March to May; probably throughout the year.
 927. *Duponchelia fovealis*, Zell.—One specimen; April 14th, 1902.
 1039. *Nomophila noctuella*, Schiff.—Abundant throughout the year. The dates of capture of my specimens range from February 24th to June 7th; the variation, however, does not seem to depend on the season of emergence.
 1058. *Phlyctanodes nudalis*, Hb.—One specimen; October 10th, 1903.
 1151. *Pionea ferrugalis*, Hb.—Common from March to June. Specimens range from pale straw-colour to dark yellowish brown.
 1274. *Cornifrons ulceratalis*, Ld.—“March (var.).”—De la Garde.
 1291. *Noctuella floralis*, Hb.—Common from June to September, flying in the sunshine over fields, and feeding on flowers of wild thyme.
 1365. *Alucita tetradactyla*, Linn.—Common from April to June; Wied Kratal.
 1387. *Pterophorus monodactylus*, Linn. (?)—One specimen; June 14th, 1902. This identification appears doubtful. If correct, the specimen is very small, but I have a similar one from Greece.
 1406. *Stenoptilia bipunctidactyla*. Haw., var. *plagiodactyla*, Stt.—One specimen; April 6th, 1902.
 1437. *Orneodes hexadactyla*, Linn.—One specimen; January 14th, 1902.
 1573. *Tortrix pronubana*, Hb.—Fairly common in April.
 1608. *Cnephasia longana*, Hw. (*ictericana*, Hw.).—Common in March and April.
 1811. *Euxanthia straminea*, Hw.—One specimen; May 24th, 1902.
 1832. *Phtheochroa duponcheliana*, Dup.—One specimen; May 15th, 1902.
 2447. *Plutella maculipennis*, Curt. (*cruciferarum*, Zell.).—Common in February.
Depressaria, sp.—Common in May and August. The green larvæ were common, spun-up in leaves of wild fennel, in Wied Kratal, at the beginning of April, 1902. Pupation takes place in a cocoon formed of fragments of the fennel-leaves.
 4693. *Nemotois latreillellus*, Fb.—Common in May, but very local. I have seen the males flying around thistle-flowers in the hot afternoon sunshine.

In addition to the foregoing, I have some fifteen species which as yet I have been unable to identify.

Finally, I cannot conclude better than by thanking those to whose courtesy I am indebted for making the foregoing list as complete as possible. To Sir George Hampson my warmest thanks are due, for valuable assistance in enabling me to identify many doubtful species; and also to Mr. Gervase F. Mathew, for his extreme kindness in supplying information, and for the loan of some of the specimens from his own collection.

A NEW GENUS AND SPECIES OF LARRIDÆ FROM CENTRAL AMERICA.

By P. CAMERON.

On bringing together recently, for the purpose of study, my neo-tropical specimens of *Odynerus nasidens* and allies, I found among them a species of Larridæ which agreed almost exactly with *O. nasidens*, having the same size, golden pubescence, wing-coloration, and form. It belongs to the Lyrodinæ, and comes closest to *Heliocausus*, which may be known from it by the transverse median nervure being received behind the transverse basal, by the cubitus in hind wings being received much behind the median, by the recurrent nervures being widely separated, the first behind the middle, and by the eyes converging above.

ICUMA, gen. nov.

Eyes parallel, not converging above, reaching to the base of the mandibles. Ocelli in a triangle. Clypeus short, its apex broadly rounded. Mandibles not incised below, the apical tooth long. Temples broad, obliquely narrowed; the occiput transverse. Pronotum very short. Scutellums large. Median segment short, gradually rounded, the basal area large, closely striated. Tibiæ and tarsi spined, the fore tarsi ciliated with long stout spines on the outer side; claws long, curved, without a spine. Abdomen short, ovate; the pygidial area distinct. Antennæ short, placed close to, but clearly separated from, the clypeus. Radial cellule long, its apex narrowed, but bluntly pointed; the transverse median nervure received clearly beyond the transverse basal; the recurrent nervures are received in the apical third of the second cubital cellule; the cubitus in hind wings originating shortly beyond the transverse median.

ICUMA SERICEA, sp. nov.

Black, covered densely with a pale golden pile; the under side of scape, an irregular line across the middle of the clypeus, a line on the lower half of the inner orbits on the apex of the pronotum, a narrow one on the second abdominal segment, more than the apical half of the third, and the whole of the other segments, fulvous yellow. Legs black, a line on the under side of the femora, on the under side of the tibiæ, and on the posterior at the basal half behind, fulvous yellow. Wings fulvous hyaline, clearer at the apex, the radial cellule and the basal two cubitals smoky; stigma and costa fulvous, the nervures darker. ♀. Length, 12 mm.

Panama, Pacific side.

Head with scattered punctures, the face and clypeus more shining than the rest. Thorax distinctly but not closely punctured, the metanotum more strongly than the rest; the striæ on the basal area distinct, rather stout, clearly separated. Abdomen, except the pygidial area, almost impunctate; the area with longish, clearly separated

punctures in rows. The second cubital cellule is the smallest, and is narrowed in front; the first and second abscissæ of the radius are equal in length; together they are equal in length to the third. Hind ocelli separated from each other by a slightly greater distance than they are from the eyes. Basal four joints of flagellum rufo-fulvous below; the first joint of flagellum is shorter than the following two united.

The form of coloration shown by this species is found in various genera and species of neo-tropical Vespidae. I have a *Chartergus* which resembles it very closely.

NOTES AND OBSERVATIONS.

COLIAS EDUSA REARED FROM OVA IN 1904.—Last August I received from a friend twenty ova of *Colias edusa*, which were deposited by a female taken by him at Sidmouth, South Devon, in the same month. These hatched on the 30th, and feeding-up on clover all the larvæ pupated from Sept. 25th to Oct. 16th. I then moved the pupæ into a warm room and they began to change colour on Oct. 19th. Nineteen fine imagoes emerged from Oct. 23rd to Nov. 4th, eight males and eleven females, one of the latter being without the yellow spots in the black hind-marginal band on the fore wings.—J. B. MORRIS; 14, Ranelagh Avenue, Barnes, Dec. 12th, 1904.

TERATOLOGICAL SPECIMEN OF *HYBERNIA DEFOLIARIA*.—It may be of interest to note that on Nov. 20th I captured at West Wickham a recently emerged male specimen of *Hybernia defoliaria* in which both wings on the right side are entirely absent. The antennæ, legs, and the wings on the left side are perfectly developed and quite normal; but there is no trace of even the rudiments of wings on the right side.—A. B. KIDNER; 139, Rosendale Road, West Dulwich, S.E., Dec. 12th, 1904.

MONK'S WOOD AND *THECLA PRUNI*.—It will, I fear, be a great disappointment to entomologists in general to hear that Monk's Wood, near Huntingdon, is now closed to the public. Lord Chesham, the owner, is at present preserving game in this wood so closely that the keepers have strict orders to forbid the entrance of entomologists. The result of this will, no doubt, be an increased difficulty in obtaining a good series of *T. pruni*, for, although the species does occur elsewhere—notably at Barnwell Wold—still Monk's Wood may be regarded as its headquarters in the British Isles. So much so that those desiring to take *T. pruni* with their own hands have for the last hundred years undertaken a pilgrimage to this celebrated Midland wood. At various times I have had the pleasure of looking through many of the best collections of British Lepidoptera, and I think I may safely say that the two obtainable species that are least adequately represented are *T. pruni* and *Carterocephalus palemon*—but more especially the former. Caught specimens are the rule, generally brown with age, or torn, or bereft of many scales. In fact, *T. pruni*, like *T. w-album*,

to be really fine, must be bred. It is then of an intensely black hue (instead of black-brown) and is a decidedly "taking" species. *C. palæmon* is almost equally local, but is fortunately much easier to obtain in fine condition, if captured when it first appears at the end of May. I suspect the reason one so seldom sees a fine representative series is that very few collectors live within reach of this most charming member of the Hesperidæ. To some collectors the idea of placing a monetary value on British Lepidoptera is altogether repugnant. But I must confess that to me it seems the only feasible method of determining the relative value of the different species, and I do not mind confessing that I am always deeply interested in the prices charged by reliable dealers or realized at London auctions. Most of us, I think, occasionally buy species we see no other possibility of obtaining, but any one who thinks he can buy really fine specimens of *pruni* and *palæmon* at the usual quotations is grievously mistaken. I myself have bought a good deal of late years, but have never succeeded in purchasing a single fine bred specimen, or a single larva, of *T. pruni*, although I have commissioned the chief dealers to procure me the latter even at so high a price as 2s. each. I really think that a fine bred *pruni*, compared with other British butterflies, is quite worth 5s., and *palæmon* I should estimate at 2s. With regard to the range of *pruni* in these islands, I find old records of its occurrence at Linford Wood, near Stony Stratford (Entom. vii. 175) and at Beaumont, Berks (Entom. xvii. 267); but at the latter place the (single) specimen was only *seen*. I wonder if any of your readers have come across *pruni* elsewhere than in its Northamptonshire and Huntingdonshire haunts. —(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Dec. 13th, 1904.

THE NOCTUID GENUS *ALA*.—The name of this genus (Staudinger, 1882) was used by Lockington for a crustacean in 1877. Hence the later name *Trichanarta*, Hampson, 1896, will stand, and the three species will be known as *Trichanarta picteti* (*Ala picteti*, Staud.), *T. pretiosa* (*Ala pretiosa*, Alph.), and *T. ladakensis* (*Anarta ladakensis*, Feld.). T. D. A. COCKERELL.

THE ENTOMOLOGICAL COLLECTIONS IN THE OXFORD UNIVERSITY MUSEUM.—In the "Sixteenth Annual Report of the Delegates of the University Museum" (for 1903) will be found an exceedingly interesting account of work completed, in hand, or to be undertaken, connected with the entomological collections in the Hope Department of the Museum. Some idea of the thoroughness with which the labours are there conducted may be gathered from the following excerpt from Dr. Dixey's account of work upon the Pierinæ which is embodied in the "Report of the Hope Professor of Zoology" (pp. 21-69).

"In 1893 the Pierinæ in the Hope Collection occupied about fifty drawers; they were to some extent sorted out into genera and species, but the arrangement did not pretend to critical exactness, nor did it profess to represent the existing knowledge of the different species with their distribution and affinities. There were no labels except those in MS. attached to the individual specimens. These were often elaborate and written with much care; but they could not, as a rule, be read without the removal of the specimen from the cabinet. The greater

number of the species were grouped together, but several were detached from the general arrangement, and had to be sought in different parts of the collection. For reasons of this kind the difficulties in the way of making an effective study of the group were very great.

"At the present time the space devoted to the Pierinæ consists of five cabinets of sixty drawers each—three hundred drawers in all. Each specimen has been carefully considered and placed in the position that may best illustrate its natural affinities and relation to conditions of locality and season. The genera and species have been indicated throughout by easily-read labels, and synonyms have been added when they possess special interest or importance. The order of the species within each genus, and of the genera within the subfamily, has been determined with the view of exhibiting the probable relationship of the various forms on a phylogenetic basis. With every genus and every species a map is given, coloured to show the present distribution of the particular assemblage on the earth's surface. Within the limits of each species the individual specimens are arranged geographically, according to a uniform plan; seasonal modification of forms, where it exists, is duly indicated by special labels."

ÆSCHNA MIXTA IN EPPING FOREST.—Henry Doubleday is apparently not properly entitled to hold the Epping Forest record for *Æ. mixta*. In his list of 1871, Doubleday speaks of this dragonfly as being on the wing as early as June—in fact, his observations are confined to that month. Now, we claim to have a particularly close acquaintance with *mixta* in the Epping Forest district, and we have never met with the species before September; indeed, its flight seems to be restricted to that and the succeeding month. We think it is pretty clear that Doubleday wrongly identified some other species as *mixta*, or, alternatively, failed to keep a proper note of the dates of capture or observation.—F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow, Essex, Oct. 31st, 1904.

[It certainly seems to be the case that *Æ. mixta* does not appear before August.—W. J. L.]

CAPTURES AND FIELD REPORTS.

SPHINX (AGRIUS) CONVULVULI IN HAMPSHIRE.—*S. convulvuli* has been common here this season wherever the tobacco-plant was grown. A cat belonging to a gentleman residing in Brockenhurst has accounted for three specimens. She might be seen on any mild evening during August and September prowling along by the flower-beds and waiting for the moths which, although never seen in the act, she, no doubt, captured on the wing. The three specimens mentioned were taken from her mouth alive (they were not cabinet specimens); how many more she caught and consumed is, of course, unknown. *S. convulvuli* did not come to the flowers on cold nights, neither did puss attempt to go hunting. In this she showed more wisdom than some of our local entomologists. Mr. L. F. Hill, of Cremona, Brockenhurst, has

kindly supplied me with a list of forty-nine specimens which he saw, and most of which he captured, at tobacco, between Aug. 16th and Sept. 23rd, a record for this neighbourhood.—G. T. LYLE; Brockenhurst.

LATE APPEARANCE OF *COLIAS EDUSA*.—On Oct. 18th last, a fine warm day, I saw, while shooting on the marshes at Wallasea, Essex, a male *C. edusa* on the wing; after watching it a short time it settled to feed on yarrow-blossom. It was apparently in perfect condition. I hear that other specimens have recently been seen in Devon, one as late as Nov. 13th.—F. W. FROHAWK; November, 1904.

LATE APPEARANCE OF *PYRAMEIS ATALANTA*.—Owing to the recent fine warm weather, *P. atalanta* has been putting in a late appearance. On Nov. 13th my wife saw a specimen on the wing, in the finest condition, at Rayleigh, Essex, and during the past week specimens have been emerging. The larvæ were found quite young at the end of September and beginning of October, which were obviously from eggs deposited during September by specimens which emerged during August or September. Although it is generally believed that only one brood emerges in the year, I am convinced that usually, if not every year, there are two broods, the first appearing in July and August, and the second continuing through the autumn.—F. W. FROHAWK; Nov., 1904.

COLIAS EDUSA, *C. HYALE*, &c., AT FELIXSTOWE.—On Aug. 10th and 11th last I took, at Felixstowe, two female specimens of *C. edusa*, on open land, fluttering over patches of red clover. I saw six altogether, but these two alone gave any chance of capture. I also saw two specimens of *C. hyale* in the public road, but my net was disconnected, and they flew almost at once into private grounds. I was only able to spare two days for collecting out of my brief vacation, and then found the following plentiful but much worn; only a small number of the specimens captured were worth retaining: *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Vanessa urticæ*, *V. polychloros*, *Pyrameis atalanta*, *Pararge egeria*, *P. megæra*, *Satyrus semele*, *Epinephelus ianira*, *Cænonympha pamphilus*, and of *Lycæna icarus* I obtained a large series, both males and females. I may perhaps note that I did not see a single specimen of *P. cardui*, neither have I met with this species during the year in or near London.—W. T. PAGE, F.Z.S.

LEPIDOPTERA AT KINGSTON, SURREY.—*Cheimatobia boreata* is simply swarming at the lamps here just now. It is no exaggeration to say that one might easily take hundreds each evening. Previous to this year I had only one specimen taken in Kingston, although I have often searched for it. I may also mention that *Chesias spartiata*, *Oporabia dilutaria*, and *Hybernia defoliaria* have been extremely abundant, and some beautiful forms of the latter have been obtained. I have seen a specimen of *Asteroscopus sphinx* (*cassinea*) which was taken on the hill, also a few *Diloba cæruleocephala*. I have not seen *H. aurantiaria* at all this year.—PERCY RICHARDS; "Wellesley," 11, Queen's Road, Kingston Hill, Nov. 18th.

SPECIES OF *PLUSIA* VISIT FLOWERS OF STACHYS.—When capturing insects on the wing at dusk this year, I noticed a fact which may not

be generally known. It is that several species of *Plusia* come to the flowers of the hedge woundwort (*Stachys*). I have never seen the name of this plant in the list of natural attractions, but of some *Plusias* I could have captured large numbers, so attractive is it. During the past summer the following species were captured at *Stachys*:—*Abrostola urticae*, *A. triplasia*, *Plusia chrysitis*, *P. gamma*, *P. iota*, and *P. pulchrina*. Of these species *P. chrysitis* and *P. pulchrina* were the most numerous, but both species of *Abrostola* were fairly common. *P. iota* and *P. gamma* were scarce.—W. A. BOGUE; Spring Cottage, Shepton Mallet.

[Barrett (Lep. Brit. vol. vi.) mentions the following Labiatae as being attractive to species of *Plusia*:—*Ballota nigra* and other Labiataes (*P. chrysitis*), *Stachys palustris* and *S. sylvatica* (*P. festucae*), and *Teucrium scorodonia* (*P. interrogationis*); the blossoms of various labiate plants are visited for their honey by *P. iota*. Several species of the Labiate, especially *Lamium* and *Stachys*, are among the known larval food-plants of *P. bractea*, *P. chrysitis*, *P. gamma*, *P. iota*, and *P. pulchrina*.—ED.]

NOTES ON COLEOPTERA IN SOUTH-WEST SURREY.—The following is a list of Coleoptera taken in this district during 1904;—*Cychrus rostratus*, L.: I took two specimens of this Carabid in July, and one of them exhibited traces of three irregular lines on each wing-case. *Carabus monilis*, F., *C. violaceus*, L., were plentiful on paths and under stones. *C. granulatus*, L., in the rotten wood of fallen trees and under stones on Peasmarsh. *Creophilus maxillosus*, L., abundant on dead animals. *Paderus caligatus*, Er.: I found this for the first time on Peasmarsh on Feb. 21st. *Xantholinus fulgidus*, F., in decayed wood. *Ocypus olens*, Müll., occurred frequently. *Aromia moschata*, L., in July, on willows. *Cetonia aurata*, L., common on roses. *Lucanus cervus*, L., occurred from about July 2nd, the males being far more plentiful than the females. *Prionus coriarius*, L., one female taken on July 24th, while flying against a window at night. *Melolontha vulgaris*, F., *Rhizotrogus solstitialis*, Latr., very plentiful. *Phyllopertha horticola*, L., frequently during the daytime in June, at rest on oak. *Strangalia armata*, Herbst., occurred frequently on flowers. *Geotrupes typhaeus*, L., common at Puttenham in early spring, in the loose sandy soil. I observed several dragging pellets of rabbits' excrement into their burrows. They varied much in colour, some having castaneous elytra. *Dorcus parallelipedus*, L., abundant. On March 26th I found larvæ, pupæ, and several imagines in one piece of decayed oak, *Necrophorus humator*, F., common on dead animals. *N. mortuorum*, F., occurred only once, on a dead rat near Eashing. *Cicindela campestris*, L., fairly common on sandy soil. *Notiophilus biguttatus*, F., common on ploughed fields. *N. aquaticus*, L., occasionally on Peasmarsh. *Geotrupes stercorarius*, Er., abundant everywhere. *G. vernalis*, L., occasionally in cowdung. *Timarcha lavigata*, L., on grassy banks. *Aphodius fimetarius*, L., plentiful in cowdung. *Balaninus villosus*, Herbst., on oak-trees. *Malthodes marginatus*, Latr., under bark and in *Cossus*-infected trees. *Blaps mucronata*, Latr., common in cellars and outhouses. *Pterostichus madidus*, F., *P. athiops*, Panz., *P. vulgaris*, L., *P. striola*, F., *P. versicolor*, Sturm., under stones and logs of wood. *Lampyris nocti-*

luca, L., abundant. *Coccinella 7-punctata*, L., *C. bipunctata*, L., *C. variabilis*, F., common everywhere. *Coccinella ocellata*, L., only one, taken on pine-tree, *Hister bimaculatus*, L., under stones. *Cossonus linearis*, F., very local. *Clivina fossor*, L., under stones. *Athous hæmorrhoidalis*, F., very abundant. *Edemere cærulea*, L., abundant on flowers during July and August. *Telephorus clypeatus*, Ill., and other Telephoridæ, common on flowers. *Xestobium (Anobium) tessellatum*, F., plentiful in old wood. *Nebria brevicollis*, F., *Pogonus chalceus*, Marsh., under stones on the "Hog's Back." *Amara fulva*, De G., very few met with. *A. familiaris*, Duft., *A. lucida*, Duft., common under stones, particularly on Peasmarsh.—J. A. CROFT; Charterhouse, Godalming, Surrey.

PYGÆA PIGRA IN SURREY.—In the most recent list of the Lepidoptera of Surrey *P. pigra* is noted as being uncommon, and only two localities in the county are given for the species. It may therefore be of interest to mention that larvæ of *P. pigra* are to be found more or less commonly in the Esher and Ockham districts. On August 27th last they were decidedly numerous at Wisley, and I collected over forty small ones in less than half an hour. The species also occurs at Byfleet, and I have frequently found larvæ there on dwarf willow.—RICHARD SOUTH.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, November 16th, 1901.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. Edward Goodwin, of Canon Court, Watlington, Kent, was elected a Fellow of the Society.—Mr. H. St. J. Donisthorpe exhibited the second recorded British specimen of *Orchestes sparsus*, Fahr., taken by him on August 28th last in the New Forest.—Mr. H. W. Andrews, specimens of *Atherix crassipes*, Mg., from the New Forest, the only previously recorded locality in Great Britain being near Ticehurst, Sussex.—Mr. G. O. Sloper, two aberrant forms of *Melitæa athalia*, male and female, from Luan, above Corbeyrier, Switzerland, and one male taken on June 26th this year at Martigny. The tendency of the black markings to supersede the fulvous was particularly noticeable in the latter specimen.—The President, cases containing Diptera, and a case containing the skins of African Sphingid larvæ, dried in botanical paper, and, after seventy years, still preserving their colours, from the Burchell collection in the Hope Museum, Oxford. Mr. C. O. Waterhouse, a gall of some lepidopterous insect found on the Califate bushes in Patagonia. The gall resembled that of *Cynips kollari*, but was hollow, the walls being about $\frac{1}{8}$ in. in thickness. The circular door prepared by the larva was about $\frac{1}{8}$ in. in diameter. The pupa was lying free, without any silk cocoon. It was suggested that the insect was perhaps allied to *Ecococis*.—Mr. C. H. Kenrick communicated a paper entitled "Natural Selection applied to a Concrete Case." Mr. J. C. Kershaw, papers on "Enemies of Butterflies in South China," and "A Life-history of *Gerydus chinensis*."—Mr. Nelson Annandale, B.A., a paper on "The Eggs and Early Stages of a Coreid Bug, probably *Dalader acuticosta*, with a note on its Hymenopterous Parasites."

Wednesday, December 7th, 1904. — Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair. — Mr. Horace A. Byatt, B.A., of the Colonial Office; and Mr. J. C. Winterscale, F.Z.S., of Karangan, Kedah, Penang, Straits Settlements, were elected Fellows of the Society. — Mr. Rowland Brown, one of the Secretaries, read the list of Fellows recommended for election as Officers, and to serve on the Council for the ensuing year; and there being no additional Fellows proposed, they were nominated accordingly. — Mr. H. St. J. Donisthorpe exhibited *Quedius nigrocæruleus*, taken by Mr. H. C. Dollman in a rabbit-hole at Ditchling, Sussex, this being the fourth recorded British specimen. — Professor T. Hudson Beare, a specimen of the rare Longicorn, *Tetropium castaneum*, L., taken about two years ago in the vicinity of the Hartlepool Quays, and probably introduced from abroad. — Mr. G. J. Arrow, a series of the Lamellicorn beetles from the Burchell Collection, and remarked that Burchell, at the time of their capture some seventy years ago, had already noted their powers of producing musical sound. — Mr. C. O. Waterhouse, drawings illustrating the development of the front wing in the pupa of the tusser silk-moth, showing the relation of the tracheæ to the veins, prepared for exhibition in the Natural History Museum. He also exhibited some coffee-berries from Uganda, injured by a small beetle belonging to the Scolytidæ. The beetles laid their eggs in the berries when young and green. The mature berries were often found with little of the inside left. Mr. Waterhouse further exhibited two coleopterous larvæ from the Burchell Collection from Brazil, submitted to him for determination by Prof. Poulton. One was a heteromorous larva two inches long, much resembling the larva of *Helops*. The more interesting one was noted by Burchell to be luminous, and appeared to be the larva of an Elaterid, but the prothorax was unusually large, and the head retracted beneath. — Commander J. J. Walker, the type-specimen of *Haplothorax burchelli*, G. R. Waterhouse, from the Hope Collection, Oxford University Museum. This very remarkable Carabid was discovered by Burchell in St. Helena. It is now exceedingly rare, if not entirely extinct, in its sole locality, the late Mr. Wollaston, during his visit to the island in 1875-6, having entirely failed to find the beetle alive, although its dead and mutilated remains were often met with. — The President, cases showing the results of breeding experiments upon *Papilio cenea* conducted by Mr. G. F. Leigh, who had for the first time bred the *trophonius* form from *trophonius* itself; also a photograph, taken by Mr. Alfred Robinson, of the Oxford University Museum, showing the Xylocopid model and its Asilid mimic exhibited by Mr. E. E. Green at a previous meeting. The example was particularly interesting, inasmuch as Mr. Green's record of the mimic circling round its model tended to support the view that the bee is the prey of the fly. — Dr. T. A. Chapman, M.D., read a paper on *Erebia palarica*, n. sp., and *E. stygne*, chiefly in regard to its association with *E. evias* in Spain. Describing *E. palarica*, he said it was a new species from the Cantabrian range, phylogenetically a recent offshoot of *E. stygne*, and the largest and most brilliant in coloring of all the known members of the family. — Dr. G. B. Longstaff, D.M., gave an account of his entomological experiences during a tour through India and Ceylon, Oct. 10th, 1903, to March 26th, 1904, illustrating his remarks by

exhibiting some of the insects referred to, and lantern-slides of the localities visited.—H. ROWLAND BROWN, M.A., *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 24th, 1904.*—Mr. E. Step, F.L.S., Vice-President, in the chair. Special exhibit of varieties:—Mr. H. W. Moore, of Shortlands, Kent, was elected a member.—Mr. Cannon exhibited, on behalf of Mr. Frohawk, (1) a long series of *Colias edusa* v. *helice* bred from v. *helice* ova in 1900 (autumn), showing every gradation from typical white v. *helice* to typical *C. edusa*; (2) a series of *C. hyale* showing gradation in extent of markings; and (3) a fine pale variety of the last with all the usual black markings replaced by pale opalescent colouring.—Mr. Colthrup, (1) a very pale form of *Smerinthus ocellatus*; (2) a partially xanthic form of *Anthrocera filipendulæ*; and (3) a *Dianthæcia capsicola* of a very unusual shade.—Mr. Harrison and Mr. Main, (1) *Argynnis aglaia*, from North Cornwall, with xanthic markings; (2) a bleached specimen of *Epinephele jurtina* (*ianira*), from North Cornwall; (3) *Zonosoma pendularia* v. *subroseata* from Staffordshire; (4) a series of *Boarmia repandata* and v. *conversaria* from North Cornwall, with series from Wiltshire and Isle of Lewis for comparison; (5) a series of *Aplecta nebulosa* from North Cornwall, with series for comparison from Delamere Forest, including v. *robsoni*, and from Epping Forest; (6) *Miana strigilis*, from North Cornwall, but none dark; from Delamere Forest, but scarcely any bright forms; (7) *Hybernia marginaria*, melanic specimens from near Liverpool; (8) long series of *Pieris napi*, spring brood from North Cornwall, with spring-bred Enniskillen series for comparison; (9) summer broods of the same species from Enniskillen and Delamere Forest; and (10) series of spring brood of the same species from Kilkenny, bred by Mr. Montgomery, with particularly dark females.—Mr. Montgomery, series of bred and captured *Leucophasia sinapis* of both broods, from Berkshire, Cornwall, Devonshire, Worcestershire, and the New Forest.—Mr. Hickman, an extremely dark var. of *Arctia caia* bred from a larva taken at Wye in August, 1903.—Mr. Crow, a remarkable rosy form of *Calymnia trapezina* from Hayes, and a specimen of *Pyrameis atalanta*, showing xanthic spots, bred from a larva taken at Elmer's End.—Mr. Stonell, a gynandrous example of *Lachneis lanestris*.—Mr. Joy, (1) a bred series of *Pararge egeria*, from ova laid by a female taken in June, 1903; (2) two series of the same species, bred from a pairing induced in captivity, of which (a) hibernated as pupæ, (b) hibernated as half-fed larvæ.—Mr. Chittenden, a large number of varieties and aberrations of Lepidoptera, including *Spilosoma lubricipeda* var. *radiata* with black fringes, *Boarmia repandata*, dark, *Aidalia inornata*, very dark, from Kent, very dark *Cymatophora duplaris* from Market Drayton, *Caradrina morpheus*, *Agrotis segetum*, *A. exclamationis*, *A. corticea*, all very dark, from Kent.—Mr. R. Adkin, (1) a specimen of *Saturnia pavonia*, having the body and wings undoubtedly female, while the antennæ were distinctly male. It was bred in 1904 from an Isle of Lewis larva of 1901; (2) a very dark specimen of *Syrichthus malvæ* from Brighton; and (3) a fine specimen of *Agrius convolvuli* taken at Eastbourne, Sept. 18th, 1904.—Mr. Harris, a very interesting series of *Hemerophila abruptaria*, bred from a pairing obtained in captivity between two captured specimens, includ-

ing a number of the more or less extreme melanic form.—Mr. Goulton, varied series and examples of *Hypsipetes sordidata* (*elutata*) with dark forms, *Pseudoterpna pruinata* with brown forms (bred), and light forms of *Boarmia repandata* from Ranmore.—Mr. Brown, numerous species and forms, including *Hydræcia nictitans* var. *paludis*, very dark *Xylophasia polyodon*, dark *Leucania conigera*, all from Deal; varied under sides of *Polyommatus corydon* from Reigate, bred and very varied series of *Cidaria russata* and *C. immanata* from Horsley, and light and dark forms of *Amphidasys betularia*, bred.—Mr. Dobson, twenty-seven species of dragonflies taken by him in Surrey and Hampshire during the last two years, including *Gomphus vulgatissimus*, *Anax imperator*, *Æschna mixta*, *Platynemis pennipes*, *Ischnura pumilio*, and *Agrion mercuriale*.—Mr. H. Moore, an example of *Heliconius sculata* from Trinidad, somewhat different from the type, and a series of the beautiful *H. cydno*, showing the range of variation of the snow-white markings.—Mr. Garrett, a specimen of *Pyrameis atalanta*, taken in Northamptonshire, having xanthic markings in red band of the hind wings.—Mr. South, (1) *Aplecta nebulosa* with var. *robsoni* and the so-called var. *thompsoni*, and numerous examples from many localities to show the range of variation in the species; (2) *Polia chi*, a female var. *olivacea*, and a series reared from ova laid by it, all of which were dark; * (3) an *Abraxas grossulariata* with buff ground colour; (4) *Eurrhynx urtica* with confluent or much-intensified spots; (5) *Peronea hastiana*, series from Wisley and Lancashire,† the latter including several forms; and (6) *Pædisca solandriana*, a long series, collected in two afternoons at Oxshott, including at least seven named forms.—Mr. G. T. Porritt, a fine bred series of *Agrotis ashworthii* from North Wales.—Mr. H. J. Turner, a copy of the original edition of Moses Harris' 'Aurelian,' slightly defective, picked up for a few shillings on a bookstall.—Mr. W. J. Kaye, (1) a series of *Pseudoterpna pruinata*, showing considerable variation in the banding, several bred specimens from Bude had all the usual markings suppressed; and (2) a specimen of *Titanus giganteus*, the largest known longicorn beetle, from British Guiana.—Mr. Barraud, (1) *Epinephele jurtina* var., with the usual white pupilled spot on the fore wing absent, and on the under side hind wings specks instead of spots; and (2) a brown suffused *Spilosoma menthastri* from Bushey.—Rev. J. E. Tarbat, (1) *Euthemonia russula*, with smoky hind wings; (2) a female *Pæcilocampa populi*, having a rudimentary fifth wing anterior to the right fore wing; and (3) a male *Erebia athiops* with shaded marks on left hand wings.—Mr. Bacot, varieties of various species and long series of *Spilosoma urticae* consisting of eight broods belonging to three generations, all originating from a single female captured in Norfolk. They showed large extremes of variation as regards the spotting.—Mr. Prout, for Mr. Mutch, pale aberrations of *Agrotis ypsilon* and *Phlogophora meticulosa*, with much darkened specimens of *Cleora glabraria*.—Mr. Prout, some extremely fine varieties of (1) *Melitæa cinxia*, mostly of one aberrant brood in 1902; (2) blackish ab. *ingenua* of *Aporophylla australis*; and (3) very dark *Eubolia bipunctaria* from North Devon and *Luperina testacea* from Sandown.—Mr. Edwards, representatives of all the genera closely allied to the genus *Papilio*, and contributed notes on each. The rare *Armandia thaidina*

* See Entom. xxxvii. 263.

† See Entom. xxxvii. 320.

and *Bhutanitis lidderdalii* were included in the exhibit.—Dr. Chapman, (1) a very large number of the genus *Chrysophanus* taken this year in Spain, including the var. *miegii* of *C. virgaureæ*, various forms of *C. phlæas*, from light forms to the extreme dark var. *eleus*; (2) a drawer of *Erebias*, also from Spain, including various races of *E. evias* and *E. stygne*, and a long series of a new species, which he had named *E. palarica*, and which was closely allied to *E. stygne*, but much larger than any *Erebia* hitherto known.—Dr. Chapman, on behalf of Mr. Tutt, for comparison with his own, a large number of *Chrysophanids* from many mid-European sources.—Mr. Tonge, three albums of photographs of *Lepidoptera*, most of them taken with the aid of the electric light.—Mr. Carr, on behalf of Mr. F. M. B. Carr, a specimen of *Vanessa io* having the usual eye-like spots on the hind wings very obscure.—Mr. West (Streatham) and Mr. Fremlin exhibited objects under their microscopes.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—By the kindness of the Chester Society of Natural Science an ordinary meeting was held in the Grosvenor Museum, Chester, on Monday, Nov. 21st, 1904, Mr. Rd. Wilding, Vice-President, in the chair.—The following gentlemen were elected members of the Society: Messrs. C. M. Adams, F.C.S. (Southport), Rd. S. Bagnall, F.E.S. (Winlaton-on-Tyne), J. H. Leyland (Ormskirk), W. C. Boyd (Cheshunt), John F. Dixon-Nuttall (Prescot), Rd. Hancock (Handsworth), and E. E. Lowe (Plymouth).—Dr. Herbert Dobie having welcomed the Society to Chester, the chairman called on Mr. Robert Newstead, A.L.S., F.E.S., Hon. F.R.H.S., who gave a most interesting and instructive lecture on "The Collections in the Grosvenor Museum."—Amongst interesting exhibits examined during the evening were:—Mr. Newstead, a living specimen of the male of *Lecanium hesperidum*; this he had recently bred from a colony of Coccids which had been under observation for the past three or four years, the example being the first authentic one observed, although the male had been searched for since the time of Linnæus.—Mr. J. J. Richardson, a series of exotic *Lepidoptera* mounted in frames, with slips of glass so arranged as to allow of the examination of the under sides.—Mr. J. R. Charnley, F.Z.S., fourteen specimens of insects in amber from the north coast of Germany, both the insects and clearness of some of the pieces of amber being much admired.—*Anisotoma furva* (from Crosby) was exhibited by Mr. Wilding; and a selection of British *Lepidoptera* by Mr. W. Mansbridge, F.E.S.; &c.—E. J. B. Sopp and J. R. LE B. TOMLIN, *Hon. Secretaries*.

RECENT LITERATURE.

Catalogue of Lepidoptera. By FREDERICK LOWE. Vol. i. pt. 1. Pp. 51. London: Hutchings & Crowsley. 1904 (Dec.).

THE initial instalment of this important work deals with the Nymphalid subfamily *Danainæ*, and all the species, subspecies or local races that have been described up to date are included therein. The part is interleaved with MS. paper, so that subsequent new species, &c., may be added. There is also an index to the species mentioned

in the catalogue. This method of treating the Lepidoptera by sub-families possesses obvious advantages, and the scheme of compilation has been devised to facilitate the work of the student. Where they are accessible the location of types is stated. The arrangement of genera and groups is based on a trivial character which the author states he has found constant and not confined to one sex.

Judging from the part before us, the Catalogue promises to be of the utmost utility, and will meet a pressing need.

The Second Part is in the press, and it is proposed to complete the work during the year.

CHARLES GOLDING BARRETT.

ENTOMOLOGISTS throughout the kingdom will regret to hear that on December 11th last Mr. C. G. Barrett succumbed to the malady from which he had suffered for some time past. As an authority on Lepidoptera he was known far and wide, and his willing help and kindly advice were always at the service of anyone who appealed to him. His departure from among us has created a void that will not be readily filled.

Among his contributions to entomological literature are notes contained in the 'Entomologist's Weekly Intelligencer' (1856-61), also in the 'Weekly Entomologist' (1862), and occasional communications to the 'Entomologist,' dating from 1864.

Mr. Barrett, in 1880, joined the editorial staff of the 'Entomologists' Monthly Magazine,' to which he had been a valued contributor from its foundation in 1864. Among the more important of his writings that have been published in that journal are a series entitled "Notes on British Tortrices," which were commenced in vol. ix. (1872), and continued year by year up to vol. xxvi. (1890).

In his excellent work "The Lepidoptera of the British Islands" is concentrated the knowledge acquired during a lifetime of assiduous research and careful observation. The first volume was issued in 1893, and the ninth in 1904. In the tenth volume, which was passing through the press at the time of his decease, was commenced the consideration of the Tortricina, a group in which he as an expert had long been acknowledged pre-eminent. It is ever to be regretted that he was not spared to see this great undertaking completed, and we earnestly hope that among his literary remains material will be found to enable the work to be continued to, at least, the end of the Tortricina, which, excepting the Tineina, is perhaps the most neglected group of British moths.

Mr. Barrett was elected a Fellow of the Entomological Society of London in 1884, and a Member of the South London Entomological and Natural History Society in 1889. He was President of the latter Society in 1892.

We understand that the collections of British, Continental types, and South African Lepidoptera will be realized.

THE ENTOMOLOGIST

VOL. XXXVIII.]

FEBRUARY, 1905.

[No. 501.]

SOME AMERICAN HALICTINE BEES IN THE BRITISH MUSEUM.

By T. D. A. COCKERELL.

AFTER being long neglected, the Halictinæ of America have come to receive a good deal of attention. Mr. Charles Robertson has lately published tables (Can. Ent., Sept., 1902) for the separation of the Illinois species; while Mr. Crawford has prepared, and I believe will shortly publish, a synopsis of all those inhabiting the United States. Mr. J. Vachal, in 'Miscellanea Entomologica,' 1903-1904, has in course of publication a synopsis of all the American Halictines seen by him, very many being regarded as new. All this activity is rapidly increasing our knowledge of these insects, but the value of some of the results obtained is seriously impaired by the difficulty of recognizing many of the numerous species described years ago by F. Smith, of the British Museum. Mr. Vachal, in the majority of cases, practically abandons the attempt to identify the Smith species, and gives new names to a great many bees, some of which must certainly be Smithian. I should be more ready to condemn this proceeding, had I not discovered that some of my own identifications of Smithian species, made by the most careful use of the descriptions, were quite erroneous.

The present paper is the result of an examination of the material, including most of Smith's types, in the collection of the British Museum. This collection, although it has been scarcely touched since Smith's death in 1878, is probably still the most valuable collection of bees in existence, and it is remarkable that it has not received more attention from students.

The following abbreviations are used:—(T.) = type specimen examined; s. m. = submarginal cell; r. n. = recurrent nervure; b. n. = basal nervure; t. c. = transverso-cubital nervure; t. m. = transverso-medial nervure; hind spur = hind spur of hind tibia;

area=basal area of metathorax; vibrissæ=hairs forming a fine ciliation on hind margins of abdominal segments 1 and 2.

AGAPOSTEMON.

(1.) *A. sicheli*, Vachal.—The museum contains a male of this extraordinary species from Mexico, out of F. Smith's collection. The flagellum is black, twisted like a corkscrew. The insect has the hairy eyes and plumose pubescence of Cameron's *Canohalictus*.

(2.) *A. rhopalocera*, Sm. (T.) ♂.—Easily known by the very long antennæ, with the last joint black and somewhat broadened. The yellow band on first abdominal segment has on it two dark spots. Eyes naked.

(3.) *A. nasutus*, Sm. (T.) ♂.—Easily known by the broad, yellow, turned-up anterior margin of clypeus, like a hog's snout. Abdomen with six dark bands; head broader than long; eyes naked.

(4.) *A. æruginosus*, Sm. (T.) ♂.—Runs to this in Vachal's table, but punctures of scutellum, though somewhat larger than those of mesothorax, are still extremely dense.

CORYNURA.

Abdomen red, second segment not rapidly broadening, and not much broader than first; antennal joints 9 to 11 strongly crenulate; first r. n. joins second s. m. (which is broad) very near its end (Chile).

abdominalis, Sm. (T.).

Abdomen not red. 1.

1. Head and thorax bright green all over; second s. m. parallel-sided, first r. n. meeting second t. c.; first abdominal segment narrow, second rapidly broadening to apex; antennæ very much shorter than in *abdominalis* or *marginata* (which Chilean species have very long antennæ)

jucunda, Sm. ♂ (T.); n. syn. *pseudobaccha*, Ckll. 1901.

Head and thorax at least largely dark 2.

2. Marginal cell and costa beyond fuliginous; first r. n. meeting second t. c.; hind spur with three spines; first abdominal segment narrow, but much broader at apex than at base, with no depression between it and second along lateral margins (Mexico) *discolor*, Sm. ♀ (T.).
- Wings yellowish; marginal cell and costa beyond not fuliginous 3.

3. Hind margins of abdominal segments white, edged in front with a sort of golden-brown; first and second abdominal segments both very narrow, second not expanding apically to any extent; antennæ very long; second s. m. very broad, receiving first r. n. near its end (Chile) . *marginata*, Sm. ♂ (T.).
- Hind margins of abdominal segments not so coloured;

first segment very narrow, second becoming broader apically; first r. n. meeting second t. c.; antennæ moderate (Brazil) *agilis*, Sm. ♂ (T.).

By the venation and the long antennæ, the Chilean species form a group separable from those of Brazil. In Proc. Acad. Nat. Sci, Phila. 1901, p. 218, I misidentified *C. jucunda*, owing to a misinterpretation of a sentence in the description. My so-called *jucunda* will stand as *C. ænigma*, Gribodo, while my *C. pseudobaccha* is the real *jucunda*.

The antennæ of *C. discolor* (♀) are bright orange at the tip, a useful character to separate it from *C. atromarginata*.

Augochlora titania, Sm. (T.), which I have referred to *Corynura*, has a clavate abdomen, narrowed basally, but otherwise is not suggestive of *Corynura*. It is very small; first r. n. joining second s. m. near its end; no vibrissæ; wings dusky; eyes deeply emarginate; area striato-granular.

CORYNURA BRISEIS (*Augochlora briseis*, Sm.) (T.). ♀.

Hind spur with two spines and two nodules or extremely short spines; second s. m. extremely narrow, receiving r. n. at its middle or slightly beyond; first abdominal segment broad but narrowed basally, with strong large punctures, its dorsal surface, viewed laterally, occupying a much lower plane than that of second; second segment with large punctures like first, but third and beyond lack these punctures, and have a greenish lustre; no vibrissæ; upper part of metathorax smooth and shining; scutellum dark pinkish-purple; mesothorax shining very dark purplish, with large sparse punctures, its anterior margin sharp, and overlapping prothorax.

MEGALOPTA.

I discuss under this name the species here placed by Smith, although it is evident that they do not form a natural group. Eventually, either *Megalopta* must be given up, and its species merged in *Augochlora*, or else it must be restricted to a much smaller number of species.

- Bright blue-green; abdomen shining; thorax very coarsely sculptured *ornata*, Sm.
 Not so, colours dull 1.
 1. Without metallic colours, or at most slightly purple 2.
 With bright metallic colours on some part 3.
 2. Wings strongly suffused with orange; abdomen narrowed basally; scutellum normal; body dark purplish *purpurata*, Sm.
 Wings not suffused with orange; abdomen broad at base; scutellum bituberculate; body not purplish *bituberculata*, Sm.
 3. Abdomen pallid 4.
 Abdomen dark 6.

- | | |
|--|----------------------------|
| 4. Abdomen green, covered with short pubescence . . . | <i>pilosa</i> , Sm. |
| Abdomen fulvous; scape long and slender . . . | 5. |
| 5. Face narrow; legs without black . . . | <i>idalia</i> , Sm. |
| Face broad; legs with much black . . . | <i>nigrofemorata</i> , Sm. |
| 6. Hind margins of abdominal segments 1 and 2 regularly ciliate (vibrissate) with orange hairs; metallic colours of face bluish-green and purple . . . | <i>vivax</i> , Sm. |
| Hind margins of abdominal segments 1 and 2 not ciliate . . . | 7. |
| 7. Abdomen thinly pruinose with pale pubescence; clypeus and supraclypeal area strongly suffused with crimson . . . | <i>cuprifrons</i> , Sm. |
| Abdomen not thus pruinose; face brilliant golden-green, vertex purplish . . . | 8. |
| 8. Larger; tegulæ dark . . . | <i>janthina</i> , Sm. |
| Smaller; tegulæ ferruginous . . . | <i>caliope</i> , Sm., ms. |

The following notes, additional to the table, will serve to confirm identifications made by it:—

(1.) *M. bituberculata*, Sm. ♂ (T.).—Face narrow; ocelli large; wings hairy; hind spur microscopically ciliate (but probably spined in the ♀, which I have not seen); first r. n. joins second s. m. well before its end; third s. m. very large, about as large as first.

(2.) *M. janthina*, Sm.—Ocelli only moderate; wings hairy; stigma large; both r. n. received by third s. m. (near base and apex), which is not nearly so large as first.

(3.) *M. purpurata*, Sm. (T.).—Ocelli large; first r. n. joining second t. c.; third s. m. not nearly as long as first.

(4.) *M. cuprifrons*, Sm. (T.).—Wings hyaline, not at all orange, but costa and marginal cell fuliginous; first r. n. joining second t. c.; second r. n. entering third s. m. farther from its end than in *janthina* (in *janthina* almost at its end); ocelli moderate; first abdominal segment with very numerous large strong punctures.

(5.) *M. vivax*, Sm. (T.).—Ocelli moderate; wings dusky hyaline, not yellowish or dark on costa; first r. n. joining third s. m. at its extreme base; second r. n. joining third s. m. as in *cuprifrons*.

(6.) *M. ornata*, Sm. (T.).—Bright green, face splendid crimson; ocelli fairly large; thorax with very large punctures, becoming subcancellate; hind spur with numerous (6 or 7) long spines; first r. n. meeting second t. c. on the basal side.

(7.) *M. pilosa*, Sm. (T.).—Hind spur with long spines; first r. n. joining second t. c.

(8.) *M. nigrofemorata*, Sm. (T.).—Ocelli rather large; wings hairy; first r. n. meeting second t. c.; second r. n. joining third s. m. almost at its end.

(9.) *M. idalia*, Sm. (T.).—Hind spur with few long spines; first r. n. joining second s. m. near its end.

(10.) *M. calliope*, Sm., from Ega, Brazil, was never published. I should refer it to *Augochlora*, with the following characters:—

AUGOCHLORA CALLIOPE (Smith) n. sp. ♀.

Head, thorax, and abdomen dark purple; face brilliant golden shining with coppery; clypeus very sparsely punctured; mandibles dark ferruginous; ocelli moderate; area with a beautiful crimson lustre (orange-golden lustre in *janthina*), and delicately striate; scutellum not bituberculate; hind spur with very few long spines; hair-brush at apex of basal joint of hind tarsi orange-fulvous; venter of abdomen with quite abundant white hair; first r. n. joining second t. c. (entering third s. m. near base in *janthina*); second r. n. joining third s. m. at its end; stigma large.

AUGOCHLORA FESTIVAGA D. T. (*festiva*, Sm.) ♂ (T.).

Santarem.—This is a peculiar species, in some things suggestive of *Corymura* and *Megalopta*; it has gigantic ocelli, such as are not seen in *Megalopta idalia*; nor has it any vibrissæ. Face white-pruinose at sides, much narrowed below; clypeus prominent, its central part yellow; scape yellow, with the apex brown; ocelli large for *Augochlora*; mesothorax shining, smooth; area shining, slightly rugose, not striated; each side of metathorax with a very remarkable dense patch of slightly yellowish cotton-like pubescence; posterior face of metathorax shining, longitudinally sulcate; legs yellow; abdomen with the first two segments, and base of third, shining fulvous; wings hairy; second s. m. very narrow, with parallel sides; first r. n. joining second t. c.; fourth ventral segment of abdomen with middle of apical margin produced.

HALICTUS NANUS (*Augochlora nana*, Sm.) (T.).

Very small; head and thorax yellowish-green, abdomen and legs entirely fulvous; inner orbits not emarginate, but gently concave; first r. n. joining second s. m. at its end; outer nervures weak as in *Chloralictus*.

HALICTUS ASPASIA (*Augochlora aspasia*, Sm.) (T.).

♀. Inner orbits gently concave, not emarginate. Front, vertex, mesothorax, and some adjacent parts, entirely covered with a dense moss-like fulvous tomentum; abdomen largely covered with a similar tomentum, and its tegument fulvous, the bases of the third and fourth segments becoming black (but this colour mostly concealed by the pubescence); venter dark red-brown with fulvous bands; first and second dorsal segments without vibrissæ; area strongly defined, strongly longitudinally striate-ridged; tegulæ fulvous; first r. n. joins second s. m. before its end; nervures very pale, outer nervures weakened as in *Chloralictus*; hind spur with few spines.

THE EARLIER STAGES OF *CATACLYSTA*
LEMNATA, L.

BY T. A. CHAPMAN, M.D.

(Concluded from p. 5.)

The newly-hatched larvæ are 1.5-2.0 mm. long, according to the degree to which they are extended; they have hairs apparently in precisely the same positions as the older larvæ, but the principal setæ are very long, II and III being more than half the diameter of the larva in length, and the middle pair on the anal plate three times as long, *viz.* about 0.3 mm., the others being about 0.1 mm., and I about 0.07 mm. The circle of hooks on the prolegs contains about eighteen crochets, all of about the same size, and not in two or three lengths as in the older larvæ.

In an older larva the thoracic plate possesses at its anterior border three pairs of hairs, much like those on the next two segments, but has also one towards the middle at its dorsal and another at its outer edge, and there is one in the posterior half-tinted border. On the first abdominal, I is on one side duplicated, a rare variation. I, II, and III are in usual position, IIIa, is wanting, but is present as a very minute point on the following segments. IV+V has the posterior and smaller member the higher, a character apparently common to all *Pyraustidæ*, and the reverse of what occurs in *Pyralidæ* and *Phycitidæ*. Below these, first abdominal has two hairs at regular intervals; on second the first of these has a companion above and behind it; on third the lower of these is represented by the usual three hairs above and one below the proleg. The anal plate is rounded, and has three hairs down each side. Ninth abdominal has four hairs in line, the third hardly visible; they range with and may be I, II, III, and IV+V.

The prolegs have a complete circle (or oval) of crochets, of which the inner and outer ones are closely set and nearly of a size, but the anterior and posterior have the alternate ones of more than double the size of the others, to the number of three or four on each margin. The claspers have about seven large hooks anteriorly, with smaller between, and beyond these at either end they dwindle away to mere points in about a dozen crochets, slightly alternate in size. On both prolegs and claspers are a few points here and there, as if representing a third class of still smaller crochets.

The general surface is covered with very minute black points, to which, in fact, the dark colour of the larva is due; these are ranged or massed in some degree more densely in zones, so as to suggest three subsegments in each segment, the anterior

being the larger. They are ranged in some degree in transverse and other lines, but broadly their arrangement is too irregular to be described. They present various circular lacunæ, one of which, a little above and behind the spiracle and two to three times its diameter, is conspicuous. The spiracles are very inconspicuous.

The head and mouth parts are not very intelligible without elaborate drawings. The second (?) antennal joint is very long, and the jaws have a remarkable form. Where they face each other they have not merely a toothed margin, but have a circular face, hollowed centrally, and with teeth round more than half the margin, so that they are like scoops with toothed edges. This structure seems to be attained by the ordinary five teeth being placed in more crowded disposition than usual, and then continued and supplemented beyond the end with largest (not smallest) teeth by a little row of four smaller accessory teeth, which I do not remember to have observed before in other larvæ (of course I have examined really very few). The circle in which the teeth lie is, however, continued right round to the attached margin of the jaw, suggesting that the two jaws form a more than usually closed pocket, possibly to retain sap, &c., in sub-aqueous mastication.

The larva moults four times. The difficulty of following any individual larva and noting its moults seemed to be so great that I did not attempt it, but I preserved first instar larvæ and full-grown ones, as well as a considerable number in intermediate stages, of which those in second instar were the only ones of whose stage I was certain. But, arranging all my specimens by the sizes of their heads, I find that between the second and the last instars two, and only two, sizes occur, and these five sizes range themselves in regular order. This method is of course nevertheless not so sure to be correct as the actual observation of each moult in one individual.

The pupa is 8-10 mm. in length and 3 mm. in breadth, varying a little in size, and especially the females are the larger and wider; but there is much latitude in size in both sexes. The apparent size varies also a good deal, owing to the amount of collapse possible in the two free abdominal segments (five and six). In a dead pupa these close up very much by drying, and in an empty pupa-skin they are often completely telescoped.

The widest part of the pupa is at the end of the wings, some 5.5 mm. from the front. Seen laterally, the pupa is of somewhat ordinary oval form, well rounded at each end, and a little flat in front; but, viewed dorsally (or ventrally), it tapers to either end, and this looks more remarkable forwards, conically rather than by an oval outline. At any rate, it differs from our average idea of a pupa in this direction.

The next point to attract attention is the projection beyond the wing-cases as a free spine of the cases of the third pair of legs, supported basally by the wing apices and the ends of the second legs and antennæ.

The colour is a pale brownish, decidedly darker than straw-colour, but still nearer straw-colour than to the ordinary pupal brown.

The wings and appendages are fixed to the end of the fourth abdominal segment. The hind wing is visible between the fore wing and the abdominal dorsum as a narrow strip, made somewhat waved and irregular by having to accommodate the spiracles on second and third abdominal; it ends at the end of third abdominal segment, at the anal angle of fore wing, it being the hind margin of fore wing that crosses the fourth abdominal segment. The inner margins of both wings, and especially of the under one, have many fine wrinkles or creases, probably due to resistance to the backward movement of the wings that takes place when they expand immediately after pupation.

The spiracles are interesting; on second, third, and fourth abdominal segments they have a very elaborate circumvallate fortification and are very conspicuous; on the other segments (fifth, sixth, seventh abdominal) they are quite simple and not very easily seen. In these special spiracles is first and centrally the spiracle proper, consisting of a central opening (transverse to length of pupa), with a fibrillate margin, and round this a set of fine circular lines, making the oval spiracle into a circular (or nearly so) area. Next round this is a smooth dome-like area, by which the spiracle is raised on to a prominence, and next a series of raised ridges varying in number and form, but apparently trying to be circular, but forced by the wings to extend themselves as trenches along the wing border.

The effect of these spiracles on the associated tubercles suggest strongly that the spiracles have been forced dorsally by the wings—a circumstance not distinctly suggested, as in many similar pupæ, by the form of the circumvallate ridges.

The dorsal tubercle I is generally easily seen, but II cannot be found; III is situated fairly normally, as in the larva on fifth, sixth, and seventh abdominal, and IIIa, is in front and above the spiracle. On fourth abdominal, III and IIIa, are fairly normal in direction from the spiracle, but are close to the circumvallatory ridges. On third, however, III is quite as much in front as above spiracle, and on second abdominal segment it is quite in front of spiracle; IIIa, though in front in both cases, is rather below spiracle in third, and quite so on second segment.

At first view, one demands, is this not V, in a situation very usual for it in some families, but, by tracing its migration

segment by segment, as above, its real nature is not open to doubt; and further confirmation comes from finding IV and V close together a considerable way below the spiracles on the following segments disposed as in the larva. These hairs and tubercles are microscopic, and the pupa may be described as quite smooth, as that idea is usually understood. There is a pair of hairs on the face, but there seem to be none on the thorax. They appear to have become obsolete, like II on the abdominal segments.

The two anal spines noted by Buckler are very curious; they are on the tenth abdominal segment, but the segmental incisions are so obscure that in some views they seem to be on the ninth. Their situation is quite dorsal, dorsal to the spiracular level; they point directly outwards, and are thin and flat, so that even from behind they appear to lie almost flat on the surface.

Noting the appendages in front, there is a well-marked labrum, and there are angles of the face below it that may be the mandibles; between these is a small angular space, the floor of which is no doubt the labial palpi. Between the eyes and the base of the second pair of legs is a small square piece abutting against the antenna. I believe I have called this piece the maxillary palpus in some pupæ similar to this one, and I am not prepared to say positively that it is not, as it occupies precisely the position that the end of the palpus occupies in all those *pupæ incompletæ* in which its nature is obvious. Here, however, on dehiscence, this piece remains attached not to the maxilla, but to the prothoracic dorsal piece, and it seems therefore that it really is a portion of the prothorax visible in front of the antenna.

The pupa possesses a primitive feature in having a separate dorsal head-piece, to which the eye-piece, separated from the rest of the face, remains attached on dehiscence. The maxillæ reach more than half-way to the wing-tips, and then disappear by passing under the second pair of legs; in some specimens there is an appearance as if the extremity came to the surface just at the wing-tips, behind the free portions of the appendages. In dehiscent specimens the applied surfaces of the hind legs in this process separate, and leave an angular line that looks sometimes as though there were something else besides the hind legs present; this could only be the maxillæ. The appearance is, however, due merely to the exposure of the inner aspect of the leg-case.

Between the maxilla and first leg is a portion of the first femur (as in sphingids, &c.); the first legs are cut off from the face (eye) by the angular portion of the prothorax, and do not extend quite as far as where the maxillæ disappear. The second legs and antennæ, as already noted, reach a little beyond the end of the wings, along the free portion of the third leg-cases.

It is noteworthy that in the female they hardly reach one-third of the length of the spine formed by the third leg-cases, whilst in the male they reach rather more than two-thirds.

The wing apices are long and pointed, quite different to those of the imago, and reach inwards behind the antennæ to the second pair of legs. The apex of the hind wing also appears here, and is as pointed, and a little longer than the fore wing.

The front of the last abdominal segments differ in the two sexes in the usual way, the male having two eminences on the ninth abdominal segment, whilst the female has a longitudinal impressed line on the eighth. On the ninth, however, the female structures are of a very unusual character. There are nine or ten raised ridges, parallel and longitudinal, and the sharp edges of the ridges are of dark (dense?) chitin. Though straight longitudinally, they have an antero-posterior curvature, such that the set together look just like the upright iron bars placed to protect windows, where the lower portions are bent outwards.

It may be well to recapitulate that the larva is truly aquatic, *i. e.* in water and wetted by it, in the first instar. Afterwards, though under water, is aerial, *i. e.* surrounded by air in a case. To compare it with the allied species, *A. niveus* and *N. stratiotata* appear to be aquatic throughout. *H. stagnata* appears to be aerial after hybernation, but I can find no definite statement on the point. *H. nymphæata* is aerial; I do not find any definite statement that it is aquatic in first instar. It is the species described by Reaumur, and often since as filling its case with air, and the one that most readily occurs to us in thinking of the group. At top of p. 2 I was thinking of *nymphæata* rather than *stagnata*, of which I was speaking.

EXPLANATION OF PLATE I.

Details of Cataclysta lemnata.

FIG. 1.—Eggs, as laid under a leaf of *Lemna trisulca*, $\times 20$. The reproduction of photo (by A. E. Tonge, Esq.) fails to show the slight sculpturing, but gives size, and shows method of laying, *viz.* border to border, and not imbricated, as is usual in this sort of scale-like egg.

FIG. 2.—Diagram of one side of larva-skin, from medio-dorsal to medio-ventral line, to show disposition of tubercles from first thoracic to third abdominal segments.

FIG. 3.—One mandible, much magnified, to show marginal teeth supplementing the usual five, and forming a scoop ($\times 160$).

FIG. 4.—Side view of pupa, $\times 8\frac{1}{2}$.

FIG. 5.—Portion of dehiscent pupa, $\times 10$, shows:—1. Dorsal head-piece, carrying (2) eye-cover. 3. Prothoracic cover, carrying (4) ventral portion, that looks in pupa like maxillary palpus. 5. Mesothorax. 6.

Antenna. 7. Metathorax. 8, 9, and 10. First three abdominal segments. 11. Fore wing. 12. Hind wing.

FIG. 6.—Another portion of dehiscent pupa, $\times 10$, showing appendages. 1. Face piece. 2. Labrum. 3. A rent due to flattening preparation. 4. Antenna. 5. Eye-cover restored to natural position; it is at once torn from here if in handling the dorsal and ventral portions of pupa are separated, as happens also to 6. Ventral portion of prothorax, really probably outer end of dorsal plate. 7. Angle where labial palpi would form floor of space. 8. Maxilla. 9. Femur of first leg. 10. First leg. 11. Second leg. 12. Wing; third tarsi are seen beyond second leg. The main sketch is female; the subsidiary addition is of same parts in male pupa, showing relative greater length of second legs and of antennæ. The line on third tarsi shows where their opposed faces have been separated (on dehiscence), and not another member of appendages.

FIG. 7.—Ventral aspect of last four segments of male pupa, $\times 10$.

FIG. 8.— " " " female pupa, $\times 10$.

FIG. 9.—Portion of same, further enlarged ($\times 20$), to show grid-like arrangement on ninth segment.

NOTES ON THE WAVE MOTHS (GENUS *ACIDALIA*, AUCT.).

By LOUIS B. PROUT, F.E.S.

(Concluded from p. 11.)

But although an "*Acidalia*" cannot hibernate otherwise than as a larva, it does not by any means follow that it needs to hibernate at all. Some of the species, I believe, do need, and therefore only give a single life-cycle in the year. But others can go through their metamorphoses quite rapidly in the warmer months, being only checked by the approach of winter, so that there are two, or even three or more, generations of the imago in a single summer, the larvæ which produce the later broods necessarily dispensing with any hibernation. Cases of such double-broodedness occur, in the South of England, with *Ptychopoda dimidiata*, *P. subsericeata*, *Leptomeris marginipunctata*, and I think others, in all excepting the most backward seasons; whilst the abundant little *P. virgularia* has probably at least three generations in the year. Yet a third (and not inconsiderable) class, not at present known to throw a second brood in a state of nature, can readily be induced to do so in artificial breeding. Such are *P. inornata*, *P. rusticata*, *P. trigeminata*, &c.; and at least one of the partially double-brooded ones, *P. subsericeata*, can yield a third brood in captivity. Concerning *P. trigeminata*, let me relate my own experience, as it "points a moral," not to lepidopterists only, but to all scientific workers. I have three

times tried to breed it from the egg, and each time, in spite of the stimuli of abundant warmth and abundant food freely administered, the larvæ have persisted in hibernating; and had I had only my own experience to draw upon, I should by this time probably be dogmatically asserting that this was one of the species which did not allow of artificial "forcing." But Barrett writes as follows ('Lep. Brit.' viii. p. 18): "On the wing in May and June, and as a partial second generation, at the end of July and in August, but Mr. A. H. Jones records that if fed up in moderate warmth the second generation becomes complete, every moth emerging in August or September." Two or three friends, whose word I would trust as implicitly as my own, have confirmed this last statement from their own experience; and I am fain to admit that mine has really been quite exceptional, albeit thrice repeated. My moral is obvious. *Do not generalize on slender data.* By all means record personal experiences, but use them, not as a basis for too sweeping deductions, but simply as one tiny contribution to be cast upon the common heap, from which, at last, sound generalizations may be made practically without fear of a "possibility of error."

I have said above that an "*Acidalia*" "cannot hibernate otherwise than as a larva." One would not be surprised therefore to hear that there was further a fixed age, or larval stadium, assigned for this important period in its economy. There was a good deal of talk in our entomological circles a few years ago about this fixed hibernating stage and the certainty of death if the stress of weather, or of failure of food, met the insect at any other than the right period. But some data are already to hand showing that the operation of natural selection is not always so cruelly rigid as this, but—sometimes, at least—allows of a little flexibility. Thus our "Wood Argus" butterfly and our common "Brimstone Moth" can winter either as larva or pupa; Mr. R. South once successfully hibernated four larvæ of *Coremia unidentaria*, a species which almost invariably hibernates as pupa; and in the *Acidaliæ* I have certainly had *P. rusticata* and almost certainly also *P. inornata* hibernate in two different larval stadia.

Where *Acidaliid* larvæ may be found—or sought—I have already indicated to a certain extent. They are all low-plant feeders; few, if any, are specialized to a particular plant; and therefore, theoretically, they might occur almost everywhere. But there are few things more noticeable than their extreme localization, and often they seem almost gregarious, so closely does a particular colony keep to a particular hedge or bank. There was a little bit of hedge opposite Highams Park Station where, for years, the imago (and therefore of course the larva, if one had searched closely enough) of *P. interjectaria* positively swarmed; I have had seven in my net at once when "dusking" along that hedge. And most entomologists have

had some similar experiences with members of the genus. The wider question of "Where—" *i. e.*, that of geographical distribution—deserves separate treatment and shall be passed over for the moment.

How do the larvæ feed? They are somewhat specialized in their tastes, notwithstanding that I have just denied their specialization to any particular plant. Their peculiarity is that, unlike most caterpillars, they have a strong preference for *withered* or even *mouldy* food. We may be interested or amused at this apparently unnatural taste; but let not those of you who have any liking for "high game," or for certain cheeses which I could mention, or even for dried vegetables or fruits, "cast the first stone." *P. rusticata* likes dead and mouldy leaves, and is suspected of feeding, in a state of nature, on fallen elm, hawthorn, and other leaves under the hedges in which the moth occurs. *P. dimidiata* is stated to be "even well pleased with a mouldy slice of turnip!" *P. herbariata*, so scarce in England, where it is certainly not indigenous, does not mind how dry its food is; indeed, the few that have been taken in this country have been in herbalists' shops, where, doubtless, the larvæ had fed up; it is also reputed occasionally to attack herbaria. *P. dilutaria*, better known as *holosericata*, has a very interesting habit; it first bites nearly through the leaf-stalk of its chosen plant, causing the leaf to droop and wither, and then feeds off the delicacy thus prepared. *Sterrhæ ochrata* will not touch fresh leaves when withered ones are at hand; yet likes to have the latter sprinkled with water. *P. virgularia* used to be found freely by Rössler feeding on brushwood heaped up in his garden. I rear nearly all my *Acidalia* with withered dandelion leaves, and with a generous supply of these, larger and finer specimens may often be reared than are met with in a wild state.

How are the larvæ protected? They are mostly of a very sober brown or brown-grey garb, and probably most of them sufficiently resemble little bits of curled-up dead leaf, &c. A few, such as *Leptomeris strigilaria*, are long, thin and twig-like, and rest in a rigid position to aid this resemblance. But these, or at least the one just named, have also a more aggressively defensive habit, which has caused me a good deal of amusement. When disturbed they throw themselves into the most violent and indescribable contortions, during which it would probably be as hard for any small enemy to seize them, as it is to get a firm hold of the proverbial eel. Curiously, I have, during the past summer, made acquaintance with three Geometrid species which indulge in these remarkable acrobatic performances, which I had never witnessed in any prior to this year, though of course I had heard of them. The three species are the common *Panagra petraria* (whose larva I had never found simply because I had never searched bracken for it at the right time), the much scarcer

Anticlea cucullata, and *Leptomeris strigilaria*, ova of which Dr. Chapman sent me from Guethary (Basses-Pyrénées) this summer. Mr. Barrett says that the larva of *L. immorata*, another of the long, thin, rigid species, "if touched, coils up almost like a watch-spring." Mr. Bacot reports on the larva of *L. incanata*—a continental species, not occurring in Britain, but related to our *marginepunctata*—that "They rest either in an extended position or with a partial double spiral coil." I have also noticed these singular coils in others of the slender group of larvæ—*L. imitaria*, &c. The stout species, which cannot actually coil themselves, like to rest in slightly curved positions or sometimes quite straight, and when disturbed bend the front segments in to meet or approach the under side of the hinder, making a form which may very roughly be likened to a figure 2; whereas the thin larvæ, in making the "spiral," of course have to bring the front segments round *beside* the hinder.

To give, in a paper like the present, the technicalities of the larval descriptions which Mr. Bacot has kindly prepared on *Leptomeris incanata*, *Ptychopoda trigeminata*, and a Pyrenean species *P. asellaria*, would serve no useful purpose; we shall hope to make scientific use of them when a larger number of species have been studied in the same thorough way. I have myself, in addition, some fairly full notes on certain stages of the larvæ of *P. virgularia* and *L. strigaria*, made four or five years ago, and some on the newly-hatched larva of *P. trigeminata*; and these furnish a few further details of value for our studies, as do also some very good notes on the earliest stages of *L. emutaria* by Mr. A. Sich (Ent. xxxvii. p. 108). I will only now mention one or two general points.

So far as I know personally, all the Acidaliid larvæ are, on first hatching, distinctly slender in proportion to their length, though probably in somewhat varying degree. I learn from Van Leeuwen's account in Sepp's 'Nederlandsche Insecten,' that those of *P. humiliata* and *P. interjectaria* are stouter than most. I find from my notes that *P. trigeminata*, which becomes decidedly one of the stumpy ones in its later stages, is slender at first, and so is *P. virgularia*, which is of medium proportions when full grown, as well as such larvæ as *L. strigilaria*, *strigaria*, &c., which remain slender to the last. The arrangement of the tubercles would seem to be fairly constant. The setæ furnish some interesting structures, and I fancy will yield material of some classificatory value. Sometimes they are fairly normal, short, stiff hairs, often they are thickened or clubbed at the extremity, sometimes thickened throughout, sometimes (as in newly-hatched *P. trigeminata*, or in *P. asellaria*, up to the very last) they begin thickening rapidly almost from the base, and make either a flask-shaped structure or something approaching an inverted pyramid. I suspect that some of these last-named

structures are glandular, and I cannot help wondering whether they are akin to what Mr. Burrows calls "battledore processes" in the larvæ of the "Emeralds," though I understand him that these are not homologous to the true larval setæ. Most, if not all, of the Acidaliid larvæ have the skin decidedly rugose in appearance, subsegmentation distinctly marked, and generally a more or less well-developed lateral flange.

Earlier in my paper I spoke of the two large genera into which—excluding *ochrata* and perhaps *rusticata* and *fumata*—Meyrick and others find our imagines divide according to neurulation and leg-structure; and I have stated or hinted two or three times in its course, that these seem to be roughly correlated with some of the more striking larval differences. Ever since the Acidaliid larvæ have been at all systematically described—i. e., since the time when Buckler and Hellins were at work—it has been customary to speak of the "short broad *Acidalia* type" and the "long thin." Now it is noteworthy that the larvæ of all the British species which fall under Meyrick's *Leptomeris*—namely, *remutaria*, *immutata*, *marginipunctata*, *ornata*, *imitaria*, *emutaria*, *strigilaria*, *immorata*, and *rubiginata*—belong most distinctly to the "long thin" group; and so do such non-British ones of the same genus as I have had under observation (*incanata* and *strigaria*), or as are known to me from figures and descriptions by Millière, &c. The least unequivocal—to judge from the figures—is that of *L. ornata*, and this, with its allies, has been placed into a distinct section by Lederer, on account of the indentations of the margin of the hind wing between veins 4 and 6, and would, perhaps, form the type of a natural genus—*Craspedia*, Hb. There are, of course, other larval characters which go with this "long thin" group, such as the nearly cylindrical form, the comparative freedom from rugosities, the extremely short setæ apparently seldom developing, in the later stages, into the clavate forms, &c.

The bulk of the remaining species—Meyrick's genus *Eois*—have quite a different type of larva, short and thickened—especially posteriorly, more or less flattened, very rugose, generally comparatively hairy, the hairs often knobbed at their extremity. But I fancy they are less homogeneous than the *Leptomeris* group, and will need careful revision. A few seem almost to form connecting links between the group in which their imago would place them and *Leptomeris*; *P. virgularia*, for instance, has not very much of the typical *Ptychopoda* character, and even *P. bisetata*, *P. straminata*, *P. subsericeata*, &c., make some approach to the intermediate form. Still, I do not think any of them are capable of assuming the spiral coil characteristic of true *Leptomeris*,* and they all show some approach to the

* *P. virgularia* may be an exception, as some small, but by no means newly-hatched, larvæ kindly given me by Mr. South since this paper was written, show a strong predilection for the *Leptomeris* attitude.—L. B. P.

flattening, the thickening, &c., characteristic of their congeners. By the way, the pupa-case of *subsericeata* is superficially very different from all the others which I have, whether of *Leptomeris* or *Ptychopoda*; but I have made no close examination of them.

A few words in conclusion as to the distribution of the species of "*Acidalia*." I have remarked, in connection with the larvæ, how extremely local they generally are, and a study of our British species will afford plenty of illustrations. We have one species confined, in these islands, to Lewes, one to Freshwater (Isle of Wight), one almost to Deal, one to Folkestone, one to the "Breck Sand" district of Norfolk and Suffolk, one to the Isle of Portland, while others are only a little less restricted in their range—e.g., *P. rusticata* (which has colonies in the Isle of Portland and in the Northfleet-Gravesend district, but hardly occurs elsewhere), or *P. contiguaria*, which is confined to the mountains of Wales. With the exception of this last, and possibly the Breck Sands, each habitat which I have named may reasonably be described as southern, and it should be added that a few of the other species, though somewhat more widely distributed, are distinctively southern, others mainly so, while very few of the species extend into Scotland. Our only characteristic northern species of the group is *Leptomeris (Pylarge) fumata*. These facts shadow forth what no student of the Palæarctic Geometrids as a whole can fail to notice—namely, that the genus, or subfamily, belong more to southern Europe than to northern. It has been my good fortune to have brought to me by my kind friend Dr. Chapman four collections from different parts of Spain, and one (some years ago) from Norway; in all the former, Acidaliid species were very much in evidence, generally indeed forming the dominant family; whereas in the Norwegian collection, amongst a large number of species, there was only one of them (*L. fumata*). In Staudinger and Rebel's 'Catalogue of the Palæarctic Lepidoptera,' the genus is credited with 179 species, of which we in Britain can claim 27, or about one-seventh. The total number of Geometrids is given as 1229, of which Britain yields about 275, or well over one-fifth. The discrepancy is fairly marked, and would be still greater were it not for the number of species which just maintain themselves in one spot in our southern counties (chiefly on the coast). These species will give much food for reflection to the student of geographical distribution, and I regret that I have no definite suggestions to offer on the subject. I trust I have said enough this evening to show that, both in this and in other directions, the homely little "wave moths" are not unworthy of the attention of the scientific naturalist.

AN ABBREVIATED LIST OF BUTTERFLIES FROM THE SOUTH OF FRANCE AND CORSICA.

BY ALBERT F. ROSA, M.D.

THE following are a few notes on the more special butterflies observed during three visits to the South in 1902-3-4. The two first occasions included Nîmes (Pont du Gard and Remoulins), Digne, and Hyères; in 1902, May 9th to 20th, and in 1903, July 5th to 14th. Last season, ten days, from July 9th to 19th, were spent in Corsica. To obviate the too frequent repetition of full dates, it will be noticed by the foregoing that May indicates May, 1902, and July means July, 1903, unless where a Corsican locality is given, in which case July, 1904, is understood.

Papilio alexanor, Esp.—I secured one on the afternoon of the day of arrival, the 6th of July, at Digne, on the left of La Colette, the next morning two on the ridge at the other side of the Bléone, and two that afternoon on Les Dourbes road. After this it was more frequently seen, but soon began to show signs of wear. I got a series of nearly a dozen perfect specimens, including four females. The females have the ground colour paler, but otherwise there seems to be very little variation amongst mine excepting in size, one being abnormally small.

P. hospiton, Géné.—We arrived in Corsica on the 9th, and it was the 13th before this was actually taken. Leaving out those that were only seen and might be doubtful, I think we can account for about eight or ten. Our records are as follows: I got a female on the 13th, a perfectly fresh male on the 14th, had another in my net on the 15th but it escaped, another female on the 16th, liberated because imperfect, and lastly, a perfect male on the 18th. Mr. Tylecote also secured a female on the 13th, two, I think males, on the 15th, and one (or two) on the 16th set at liberty. All of these in the neighbourhood of Tattone. There is some little variation amongst mine. The female is much darker than the males, the characteristic diffused band on the hind wings and other black markings being more pronounced. One male and the female have only five marginal yellow lunules on the hind wing, the one next the costa being absent; but this lunule is developed in the other male.

Pieris daplidice, L., var. *bellidice*, O.—One taken on the Dourbes road at Digne on May 12th, and another at Pont du Gard a few days later.

Euchloë belia. Cr.—Along with the preceding, flying at the more barren parts over the shaly mounds.

E. euphenoides, Stgr.—Only a short series obtained. One or two at Digne, to the west of the town, on May 13th, and a few at Pont du Gard on the 20th, including two females. Not seen at Hyères, where I was from the 16th to the 18th.

Leptidia duponcheli, Stgr.—The spring brood was flying at Digne along with the var. *lathyrus* of *L. sinapis*, and both were taken in good condition between May 10th and 18th.

Colias edusa, Fab., var. *helice*, Hübn.—One at Digne, July 9th, and one at Corte, July 18th. *C. edusa* was very common at Tattone, but I did not see any of this variety there.

Gonepteryx cleopatra, L.—Common at Nîmes, Remoulins, and Pont du Gard early in July, but rare at Digne. Very abundant and fine at Hyères from the 12th to the 14th of the same month. In May I only saw one or two at Digne, and one at Hyères in the grounds of the Hôtel des Palmiers.

Charaxes jasius, L.—Three seen at Hyères on the hills north of the town, on the 12th and 18th July. This is the only species included in the list of which a specimen was not obtained.

Vanessa urticae, L., var. *ichnusa*, Bon.—One taken, newly emerged, at Tattone, on the 17th July. Also some larvæ from nettles, near the Hôtel du Monte d'Oro, at Vizzavona, which pupated in Corsica and during the return journey. Of twenty-eight pupæ, seventeen produced single ichneumons, and eleven butterflies emerged after I arrived home, three being cripples.

Polygonia egea, Cr.—Three taken at Digne, on the 9th and 10th July, about the beginning of the Dourbes road. No doubt a couple of weeks earlier would have been better for the taking of this species.

Melitæa aurinia, Rott., var. *provincialis*, B.—A few at Digne, about the middle of May, on the 'Les Dourbes' road and adjacent fields, in company with *M. cinxia*, which was very common and in fine condition.

M. parthenie, Bkh.—Not uncommon at Digne in July. I do not remember noticing any of *M. athalia*.

Argynnis daphne, Schiff.—A few also taken at Digne in July.

A. elisa, Godt.—At first only seen occasionally, but became very common, towards the middle of July, about Tattone and Vizzavona, especially in the fields around the former locality. The sexual variation at the extreme is very distinct, the smaller males being of a very ruddy fulvous, and the females, besides being considerably larger, are very much duller in tone; although a few members of the sexes run pretty closely alike in size and colour. By the third week of July the males especially were getting worn.

A. paphia, L., var. *immaculata*, Bell (*anargyra*, Stgr.).—All the *paphia*, which were very common in the forest at Vizzavona and at Tattone, probably incline to this variety; but it is not easy to get specimens entirely without the silver fasciæ. The violet colour seems to be associated with the development of the silver markings, because it diminishes in equal proportions and is absent in well-marked specimens of *anargyra*.

Ab. ♀ *valesina*, Esp.—This variety was frequently observed in the forest at Vizzavona, and, as might be expected, has the same tendency to suppression of the silver markings. One is *valesina* above and *immaculata* below, the under side of the hind wing being a very vivid green.

A. pandora, Schiff.—Much more frequently seen than taken, and was most common at Tattone, a few extending as far as Vizzavona station. It did not seem to occur amongst the *paphia* in the forest, but two were observed higher up on La Foce, in the neighbourhood of the hotel. One or two were also seen at Corte. I got six males and one female, having taken, after the first day or two, about one per day, not considering those discarded at the time when imperfect. One male

is all but without the silvery fasciæ on under side hind wing, thus approaching ab. *paupercula*, Ragusa, only one small crescent next the costal margin being present.

Melanargia lachesis, Hb.—Was pretty common on the road between Remoulins and Pont du Gard on July 5th. I got a series of males, but only one female.

M. galatea, L., var. *procida*, Hbst.—Common at Digne early in July. They vary a good deal, some being considerably darker than others.

M. syllius, Hbst.—Very abundant and fine at Hyères in the Beau Vallon and terraced garden plots behind the town. Taken from the 16th to the 18th May.

Erebia evias, Godt.—Two at Digne on the 9th and 11th May.

Satyrus circe, F.—Taken at Remoulins and Pont du Gard on 5th July, and common at Digne from the 6th onwards, mostly males. Females more common later, as at St. Auban, July 11th, and at Hyères about the 14th. Also very abundant in Corsica, especially in the fields around Tattone.

S. semele, L., var. *aristæus*, Bon.—Occasionally in Corsica, on the roads at Tattone, Vizzavona, &c. Only four or five taken.

S. neomyris, Godt.—Pretty common, mostly on the roads and occasionally in the fields around Tattone, Vizzavona, Bocognano, &c.

S. statilius, Hüfn., var. *allionia*, Fab.—Two taken at Hyères on the 13th and 14th July, in the terraced plots to the right behind the town.

S. fidia, L.—Flying along with the last species, which it closely resembles, but was apparently more common, judging from the number taken.

Pararge megæra, L., var. *tigellus*, Bon.—Nearly every locality visited in Corsica produced a specimen or two; never common and inclined to be getting past its best.

Epinephela jurtina, L., var. *hispulla*, Hb.—The best specimens were taken at Hyères, July 16th and 18th. In Corsica it was most abundant though not so large, and going over when we were there.

E. ida, Esp.—One male at Remoulins, and a few at Digne early in July; but most at Hyères towards the middle of the month, where the females also were obtainable. Also occasionally in Corsica.

E. pasiphaë, Esp.—Just about as abundant and in as fine condition as *M. syllius* at Hyères 16th to 18th May. One or two were also seen at Pont du Gard on the 19th and 20th. Worn specimens were also noted in July.

Cænonympha dorus, Esp.—Digne, July 6th and onwards, common at some parts, as also was *C. arcania*, both in good condition. *C. dorus* was also taken at Remoulins on the 5th.

C. corinna, Hb.—Very abundant on the Vivario road, between Vizzavona and Tattone, and also at La Foce de Vizzavona.

C. pamphilus, L., var. *lyllus*, Esp.—A few taken in cut hay-fields about Tattone.

Laeosotis roboris, Esp.—On 6th, 7th, and 8th July, at Digne, flying around pollard oak. The same tree was occasionally visited, perhaps eight or ten being seen altogether, sometimes a pair at a time. I got two males and one female, all freshly emerged and perfect.

Thecla ilicis, Esp., var. *cerri*, Hb.—This variety was common,

along with *T. spini*, in a quarry at Remoulins, and they both also occurred at Digne.

T. acacia, Fab.—One undoubted female at Digne on July 9th, and five other specimens from Remoulins and Digne which are not so certain. The latter have a row of orange spots, six in number, on the under side of the hind wing, almost reaching the costal margin (Kane gives two or three in the male and three or four in the female); at anal angle there is little or no blue, and the next spot is not marked with a black dot outside. The upper sides, however, correspond most closely with this species.

Chrysophanus phlæas, L., var. *eleus*, Fab.—Common at Ajaccio, also at Tattone and Corte. The date was apparently rather late for this brood.

Lampides telicanus, Lang.—Tattone, two in copula, but rather poor specimens.

Lycæna argiades, Pall., ab. *coretas*, O.—One on May 11th at Digne, on the mountains in Les Dourbes direction at considerable elevation.

L. argus, L. (*ægon*), var. *corsica*, Bell.—Rather common on the bracken at La Foce de Vizzavona, and also frequently at Tattone.

L. astrarche, Bgstr., var. *calida*, Bell.—Some very bright; Tattone, Ajaccio, Vizzavona, Corte, pretty common.

L. meleager, Esp.—A few at Digne, at the other side of the Bléone and Les Dourbes road, including one fine blue female. Just emerging about July 7th.

L. admetus, Esp., var. *ripartii*, Frr.—Three at Digne on July 9th, beside the river on the road to the thermal springs. Just emerging.

L. sebrus, B.—Two at Digne on May 10th, Les Dourbes direction, where the road ascends the side of the mountain.

L. cyllarus, Rott.—Common towards the middle of May at Digne, but going over. I got, however, a fairly good series, including some females.

L. melanops, Boisd.—Not nearly so common as the last-named and more worn. Half-a-dozen fair specimens, being all obtainable.

Cyaniris argiulus, L., gen. *æst. parvipuncta*, Fuchs (ex Corsica).—Common at sunny corners on the Vivario road, both in the forest above Vizzavona and in the open towards Tattone.

28, Pitt Street, Edinburgh.

A NEW GENUS OF CULICIDÆ.

By FRED. V. THEOBALD, M.A.

Genus ANISOCHELEOMYIA, nov. gen.

Head clothed with flat scales rather loosely applied to surface of head, and which form a more or less projecting mass between the eyes in front. Antennæ densely pilose in the male. Proboscis swollen apically. Palpi very short in both sexes. Thorax with narrow-curved scales in the middle, and with broad spindle-shaped ones around the front and sides; scutellum with small flat scales rather loosely applied, very distinctly trilobed. Wings ornamented. Ungues of male not very unequal in length but differing in breadth, one on each leg broad and leaf-like. Fork-cells short, as in *Uranotania*.

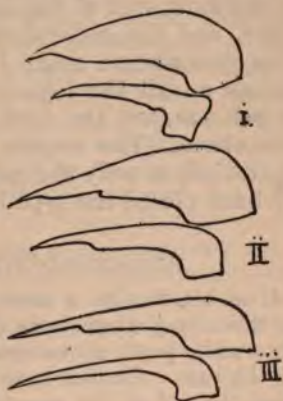
Closely related to *Uranotænia*, but differing in the non-plumose male antennæ and peculiar unguis, also in the absence of flat thoracic scales and more rugged appearance of the head and scutellum.

I cannot detect the genitalia, but the perfect specimens are evidently all three males. The unguis are the most marked characters, and can only be seen by breaking up the types. The two species are undoubtedly connected by squamose characters as well as the quaint unguis. Although the unguis are unequal, as in all male Culicids, they are not very unequal in length, but are in breadth, and differ in form. As no genitalia can be detected, I can only assume them to be all males from the abnormal unguis. A female sent was all destroyed but the head and thorax, so no details can be given. The antennæ are less pilose than in the male.

ANISOCHOLEOMYIA NIVIPES, nov. sp.

Head creamy-white. Thorax rich brown in the middle, creamy-white around the dark area; pleuræ creamy-white. Abdomen deep brown with apical white bands. Legs deep brown, with pale reflections apically, last two hind tarsi white. Wings ornamented; costa dark, veins pale-scaled except for a dark area spread across at the base of the fork-cells; a noticeable pale spot on the dark costal area not reaching the costa.

♂. Head brown, clothed with rather loosely applied creamy-white flat scales; antennæ deep brown, basal segment deep reddish-brown; clypeus brown; palpi clothed with deep brown scales and with a few long black chætæ; proboscis deep brown with bronzy reflections swollen apically, hairy. Thorax bright brown; the middle of the mesothorax with narrow-curved bronzy-brown scales, and three rows of black chætæ, the dark scaled area surrounded by thicker creamy-white curved scales, forming a well-contrasted whitish area, which is indented into the dark area on each side in front before the base of the wings; scutellum with small flat dark brown scales and black border-bridles, four to the mid-lobe; metanotum bright chestnut-brown; pleuræ clothed with dense creamy-white scales continuous with the pale areas around the mesothorax. Abdomen deep brown, with deep brown scales and creamy-white scaled apical borders; the apical segment all pale-scaled; border-bridles pale. Legs deep brown; coxæ and trochanters pale, last two and apex of the antepenultimate hind tarsi white; the fore and mid tarsi pale beneath; unguis unequal in size,



Ungues of *Anisocholeomyia nivipes*,
n. sp.
(i. Fore; ii. Mid; iii. Posterior.)

but the posterior of nearly equal length, the larger very broad and thick, the smaller abruptly curved basally. Wings ornamented; costa black and spiny; first long vein black-scaled with a large white area over the cross-veins, and a white apex; a dark area on the stem of the first submarginal cell, a small dark area beneath it on the third, most of the stem of the second fork-cell dark, also a dark area in the middle of the upper branch of the fifth and at the apex of the lower branch; the whole forming a dusky band across the otherwise pale-scaled wing; first submarginal cell about two-thirds the size of the second posterior cell, its stem twice as long as the cell; stem of the second posterior slightly longer than the cell; posterior cross-vein longer than the mid, and nearly twice its own length distant from it, situated close to the base of the upper branch of the fifth vein. Lateral scales on the fork-cells and the third long vein large and lanceolate, a few very similar ones on the apex of the upper branch of the fifth; median vein-scales small and dark on the fork-cells, third vein and middle of the upper branch of the fifth and the apex of the lower branch; those on the stem of the first fork-cell dark, and some of almost *Etiorleptomian*-form (i. e. heart-shaped), but more elongate. Halteres with pale testaceous stem and fuscous knob. Length 2.5 mm.

Habitat. Queensland (Dr. Bancroft).

Observations.—Described from two perfect specimens; Dr. Bancroft bred the specimens, which live, he says, in association with *Uranotania pygmæa*, Theob. Although very distinct, they cannot be told from *pygmæa* until boxed. This species differs from all other related *Ædinæ*, except the next species described here, in having distinctly ornamented wings. The thoracic ornamentation is also very marked, the indent of white scales into the dark area of the mesonotum in front being very characteristic, and the general sharply defined light and dark areas of the mesothorax make it very conspicuous. The tarsi show paleness on all the legs in certain lights, and all are evidently pale beneath, but the hind legs only have the last two creamy white above. The unguis are not drawn from a microscopic preparation, so only the general form is shown.

I have placed the type in the British Museum collection.

ANISOCHOLEOMYIA ALBOANNULATA, nov. sp.

Head black, with a narrow white line around the eyes with very long white projecting scales in front between them; proboscis black, with a white patch above near the apex and another large white patch near the base. Thorax deep brown, with a narrow silvery-white line around the end of the mesonotum up to the base of the wings, and another more irregular one on the brown pleuræ. Abdomen black and snow-white, ornamented with median white areas and white segments. Legs black, the hind pair with broad apical white bands, and the last two segments white; femora of all with white spots. Wings ornamented, costal border black, veins white-scaled with two broad dusky bands running across them.

♂. Head black, clothed with small flat black scales, and a border of similar white ones around the eyes, which show pale-blue reflections in certain lights under the 3rd power, in front between the eyes projects a tuft of very long white scales, there are also scattered small upright black forked scales and a small basal medial blue patch; antennæ deep brown, basal segment black, base of second segment reddish-brown; palpi very small black-scaled; proboscis black, a large silvery-white patch towards the base, and a smaller one on the dorsum nearer the apex. Thorax deep brown, with narrow-curved bronzy scales, a narrow white border around the front and sides of the mesonotum composed of broad curved scales, which appear pale-blue in certain lights, ending about the roots of the wings; scutellum deep brown, clothed with small flat deep brown scales, very distinctly trilobed, the mid-lobe large with four border-bristles; chætæ of mesothorax and scutellum black; metanotum black; pleuræ brown, with a narrow wavy white-scaled line running along it from the base of the abdomen to the head, and a few white puncta near the base of the legs. Abdomen black and silvery-white, the first segment mostly white-scaled, the second and third with a white median patch, the fourth all white, the fifth black with a few apical white scales, the sixth all white, the apical one black and white. Fore legs deep brown with a white spot at the apex of the femora and a trace at the apex of the tibiæ; mid legs with two white femoral spots and silvery-white venter to femora; hind legs with femoral spots more pronounced; tibiæ with broad white median and apical bands; metatarsi and tarsi with broad white apical bands except the last two tarsi, which are all white; unguis unequal, one on each fore and mid leg very broad and curved, a thin web-like membrane between the curved outer portion; hind not examined. wings ornamented with black and white scales much as in the former species, but there are two dusky areas across the surface. The stem of the second long vein close to the first, almost fused with it; stem of the first posterior cell nearly three times as long as the cell; stem of the second not quite twice as long; scales on the stem of the fourth rather long and broad, longer than in the former species; posterior cross-vein longer than the mid, about one and a half times its own length distant from it. Black scales on the stem of the first fork-cell, on the basal half of the third, some on the base of the stem of the second fork-cell, on the greater part of the upper branch of the fifth, a few at the apex of the lower branch, and a batch near the base, also some near the base of the fourth. Halteres with testaceous stem and fuscous knob. Length 2.5 mm.



Fore unguis of *Anisocheleomyia*
alboannulata, n. sp.

Habitat. India (Capt. James, I.M.S.).

Observations.—Described from a single specimen. The species is a very beautiful and marked one, and cannot be confused with any other mosquito. The structure of the unguis is very

peculiar. The specimen is a male certainly. The fore leg removed to show by microscopic examination the unguis, which seem to be exactly the same in the mid leg. This type is also sent to the British Museum collection.

CURRENT NOTES.

By G. W. KIRKALDY.

(Continued from vol. xxxvii., p. 305.)

11. JAS. G. NEEDHAM and others: "Aquatic Insects in New York State" (Bul. 68 N. York State Mus. (Entom. 18), pp. 199-517, pls. 1-52, text-figs. 1-26 (1903)).

12. WALTER W. FROGGATT: "Locusts and Grasshoppers" (Agr. Gazette N. S. Wales, xiv. pp. 1102-10, coloured plate) (1903).

13. BENJ. D. WALSH: "First Ann. Rep. on the Noxious Insects of the State of Illinois (1867)" (reprinted 1903 by S. A. FORBES as a Special Publication of the Illinois State Lab. of Nat. Hist.), pp. 1-140, 1 plate.

14. 'ZOOLOGISCHER ANZEIGER' (Dec. 8, 1903), xxvii. pp. 113-144.

15. 'ALLGEMEINE ZEITSCHRIFT FÜR ENTOMOLOGIE' (Nov. 1, 1903), viii. nos. 20-1, pp. 389-436.

16. J. C. KONINGSBERGER: "Ziekten van Rijst, Tabak, Thee en andere Cultuurgewassen, die door Insecten worden veroorzaakt (Meded. uit 's lands plantentuin" lxiv. pp. 1-109, pls. 1-5 (first three coloured) (1903)).

Dr. Needham, with three collaborators, has given us a valuable second instalment of his investigations upon the aquatic life of New York State (11). The first instalment* treated of the aquatic fauna of the Adirondacks; the second deals with that of Ithaca, and consists of a preface by Dr. Felt (p. 199); "Station Work of the Summer of 1901" (pp. 200-4); "Food of Brook Trout in Bone Pond" (pp. 204-17); "Life Histories of Odonata, suborder Zygoptera" (pp. 218-79); "Some New Life Histories of Diptera" (pp. 279-87)—all by J. G. Needham; "Aquatic Chrysomelidæ and a Table of the Families of Coleopterous Larvæ" (pp. 288-327) by A. D. MacGillivray; "Aquatic Nematoceros Diptera" (pp. 328-441) by O. A. Johannsen; "Sialididæ of North and South America" (pp. 442-86) by K. C. Davis; explanation of plates, index, &c. (pp. 487-517).

The Entomologic Field Station formerly at Saranac Inn was made in 1901 to Ithaca with advantage. As was to be expected considerable space is occupied by the consideration of the metamorphoses of zygopterous dragonflies, and this is elucidated by

* See 'Entomologist,' xxxv. p. 295 (1902).

2 coloured and 8 plain plates, as well as numerous text-figures. Next in extent comes the monograph of American Sialidæ, illustrated by 2 plates and numerous text-figures, and the paper on aquatic Chrysomelidæ, accompanied by 11 plates. The most extensive contribution, however, and in some ways the most important, is the section devoted to Nematocera, amounting to 114 pages and supplemented by 18 plates. As very many of the forms delineated and described are either also British or very closely allied to British forms, this bulletin should prove indispensable to British students; the price is nominal. Mention should also be made of the seven pleasing views of some of the collecting grounds.

Froggatt (12) discusses, with a coloured plate of six of the species, the short-horned grasshoppers of Australia, which is very rich in species of that fauna. Eleven species are described in this part. Entomologists will be grateful to Dr. Forbes for the timely reprint of Walsh's Classic "First Illinois Report" (13), which has long been out of print and difficult to obtain.

The December number of the 'Zoologischer Anzeiger' is devoted almost entirely to Insects (14), and contains the following papers:—

R. VON IHERING: "On the Origin of the Formation of Societies in the Social Hymenoptera" (pp. 113-8).

N. CHOLODKOVSKY: "Aphidological Contributions, No. 20, on a Species of *Phylloxera* destructive to Pear-trees" (pp. 118-9, text-figs. 1-2); and "On the Morphology of the Pediculidæ" (pp. 120-5, text-figs. 1-6). The author agrees with Melnikov that the Mallophaga and the Pediculidæ should be placed close together, but considers that they are connected with the 'Pseudoneuroptera' rather than with the Rhynchota, deeming it better to found a special order for the Pediculidæ, which he names "Pseudorhynchota," ignoring the already well-established "Anoplura."

A. THIENEMANN: "Anal Branchiæ in the Larvæ of *Glossosoma boltoni*, Curt. and some Hydropsychidæ" (pp. 125-9, text-figs. 1-3).

G. ENDERLEIN: "On the Position of *Leptella*, Reut., and *Reuterella*, nov. gen.)* the representatives of two new European subfamilies of Copeognatha (Psocidæ) (pp. 131-4).

H. STITZ: "On the Genital Apparatus of Lepidoptera" (pp. 135-7, 1 text-fig.).

A. C. OUDEMANS: "Symbiosis of *Coptorthosoma* and *Greenia*. A question of priority" (pp. 157-9).

THE ALLG. ZEITSCHRIFT (15) as usual contains a large amount of interesting notices, among which may be cited:—

P. BACHMETJEV: "On the Variability in the Length of the Wings of *Aporia crataegi* in Sophia [Lepid.]" (pp. 389-95).

G. ULMER: "On the Trichopterous Fauna of Hesse"

* Too near *Reuteriella*, Signoret, 1880.

(pp. 397-406, text-figs. 1-8), from which seventy-three species are recorded.

L. REB continues his paper "On European Coccidæ" (pp. 407-19), dealing with twenty-one species of "Lecanium."

DR. KONINGSBERGER has continued his researches upon the economic entomology of Java by his recent consideration (16) of the insect enemies of rice, tobacco, tea, coffee, india-rubber, and other plants. The metamorphoses, so far as known, are described as well as the nature of the damages. The five plates contain over one hundred figures of all orders.

ON A SMALL COLLECTION OF ANTHOPHORID BEES FROM COLORADO.

By T. D. A. COCKERELL.

THE Anthophorids are swift-flying bees, not easily caught, and on this account have not usually been obtained by collectors of miscellaneous insects. Some of them fly only in the spring, and have disappeared before the usual advent of the visiting entomologist. Thus it has happened that several large and conspicuous forms, which are probably widely distributed and not uncommon, have been overlooked until quite recently. A small collection of these insects received from the Colorado Agricultural College brings out a number of new facts which are given below. The species represented may be separated as follows:—

FEMALES.

- | | |
|--|---|
| Hair of thorax appearing grey, from a mixture of black and white | 1. |
| Hair of thorax not so; more or less yellowish or red | 2. |
| 1. Size larger; length about 16 mm., very robust | |
| Smaller; length about 13 mm. | <i>Anthophora portera</i> , Ckll. |
| 2. A patch of black hair in middle of thorax; outer side of hind tibiae with orange hair | <i>Anthophora euops</i> , Ckll. |
| No patch of black hair in middle of thorax | <i>Emphoropsis mucida</i> var. <i>johnsoni</i> , n.v. |
| 3. First three abdominal segments covered with hair, which is usually red; hair on outer side of hind tibiae black | 3. |
| Only the first abdominal segment covered with hair, which is not very red; hair on outer side of hind tibiae yellowish-white | <i>Anthophora bomboidea</i> subsp. <i>neomexicana</i> , Ckll. |
| | <i>Anthophora montana</i> , Cresson. |

MALES.

- Basal joint of hind tarsus toothed 1.
 Basal joint of hind tarsus not toothed 2.
 1. Basal joint with a large tooth; pubescence often
 red *A. bombooides* subsp. *neomexicana*, Ckll.
 Basal joint with a small tooth; pubescence never
 red *Anthophora gohrmanæ*, Ckll.
 2. Middle tarsus with copious red hair; face-marks
 light-yellow, a heavy black band on each
 side of clypeus *A. euops*, Ckll.
 Middle tarsus without red hair 3.
 3. Abdomen fasciate; thoracic pubescence often
 red; face-marks light yellow *A. montana*, Cresson.
 Abdomen not fasciate; thoracic pubescence
 never red 4.
 4. Face-marks white *Emphoropsis mucida* var. *johnsoni*, n. v.
 Larger; face-marks light yellow *Anthophora porterae*, Ckll.

(1.) *Emphoropsis mucida* (Cresson) var. *johnsoni*, n. var.

♀ (type; Fort Collins district, 1903) differs from *E. mucida* by having a patch of black hair in middle of dorsum; hair on outer side of hind tibiae shining reddish-orange, conspicuously plumose; first recurrent nervure joining second submarginal cell a little distance from its end (meeting second transverso-cubital in *mucida*); hair of middle of fifth abdominal segment light brown, at sides white.

♂. Pubescence of hind legs black on femora, white on outer side of tibiae and tarsi; abdomen with the first two segments with yellowish-white hair, segments beyond with black, except extreme sides and the apical segment.

The type was taken by Mr. S. A. Johnson in the foothills near Horsetooth Mountain, flying over a patch of larkspur. The bees were very shy, swift flyers, Mr. Johnson reports. The actual label on the specimen gives the date, May 12, 1903, and the locality "Fort Collins." I presume, therefore, that other such labels are to be understood to refer to the region about Fort Collins, but not necessarily to the place itself. This is important, because the foothills fauna certainly differs in many respects from that of the town. Other specimens, males, are from Fort Collins, May 10, 1901, and Lamar, Colorado, collected by Prof. C. P. Gillette.

This may be a valid species. I have not seen typical *mucida*, but Mr. Viereck kindly examined for me Cresson's type, and reports that it has no black hairs on the thoracic dorsum; and the hair on outer side of hind tibiae is whitish straw-coloured, and not at all conspicuously plumose. From Cresson's descriptions, I inferred that *mucida* (female) and *morrisoni* (male) were the sexes of one species, and Mr. Viereck, after comparing the types, is of the same opinion.

(2.) *Anthophora gohrmanæ*, Ckll.—Denver, Colo., May 2, 1902 (S. A. Johnson, 465); Montrose, May 5, 1901; Grand Junction, May 8, 1901. New to Colorado; previously known only by a single specimen found in New Mexico.

(3.) *A. bomboïdes* subsp. *neomexicana*, Ckll.—Fort Collins, May 29, 1901; Denver, May 24, 1902 (S. A. Johnson, 221); Parker, May 10, 1902 (S. A. Johnson, 475). Mr. Johnson writes that the Parker specimens were bred from cells collected from adobe banks along Cherry Creek, four miles north of Parker. From this group of cells he bred the meloid beetle *Leonidia neomexicana* (Ckll.).

(4.) *A. montana*, Cresson.—Denver, July 15, 1899; Fort Collins (P. K. Blynn); Livermore (E. D. Varney); foothills near Horsetooth Mountain, at larkspur, along with *Emphoropsis mucida johnsoni*, one male (S. A. Johnson). The male, which has not previously been described, is distinguished by the linear abdominal bands.

(5.) *A. porterae*, Ckll.—Golden, May 3, 1902 (S. A. Johnson, 477); Montrose, May 5, 1901. New to Colorado.

(6.) *A. euops*, Ckll.—Palisade, May 7, 1901; Fort Collins, June 12, 1898; Boulder, May 17, 1902 (S. A. Johnson, 481); Denver, May 2, 1902 (S. A. Johnson, 469).

Boulder, Colorado, U.S.A.: Dec. 6, 1904.

NOTES AND OBSERVATIONS.

PARARGE ACHINE ON THE MENDEL.—I trust I was justified in drawing attention to the peculiarity I noticed in the Mendel specimens of *P. achine*. The more so that Rühl says: "It is a usually constant species which has little or no tendency to variation—as a matter of fact, I find among more than one hundred examples before me not a single anomalous form" p. 583. I think the following additional notes, if you can find room for them, will show that, though my suggestion that the Mendel form might be a *local* race cannot be maintained, yet the form is worthy of a distinguishing name, and appears to be the form of Tyrol and eastwards, with, of course, intermediates. But none of my correspondents record it from Switzerland or France, though probably it will be proved to be everywhere an occasional aberration. I am much obliged to Mr. Rowland-Brown for his examination of collections beyond my reach. The sum of his investigations (Entom. xxxvii. p. 322) I take to be this: that Mr. Lemann's specimens of *achine* from the South Tyrol are of the form I have called "*mendelensis*," with an intermediate example from Zurich. Dr. Lang, from a series of seventeen specimens, describes the white band as broadest, and embracing *both sides* of *all* spots, in an individual from Podalia (I have specimens from Aigle and Freiburg in Baden agreeing with the Podalia specimen). Dr. Lang's examples from Amur, Switzerland, and Dresden have the band reduced in varying degrees, till some from Dresden

appear to agree entirely with my Mendel specimens. Mr. Tutt, in reply to a letter of enquiry, writes: "I have examples of *achine* I took myself at Mendel Pass in 1895; some others taken in the same district at Pejo by Chapman; and some examples I got at Fontainebleau. Only two real Switzers, though. These Mendel and Pejo specimens are extra dark on the under sides. The Fontainebleau examples are much larger and paler, the under sides with very much white." Later, Mr. Rowland-Brown writes: "I have since examined a fairly long series of *achine* in Miss Fountaine's beautiful collection at Bath. Specimens from Switzerland (mostly Glion) are type, but in the Buda-Pest specimens I find very much the same tendency of the broad band to break up with light wavy interior, and leaving the ocellated spots, as noted by you, in the ground colour of the wings." Mons. L. Dupont says: "I was interested with this new var. of *P. achine*, as I had never seen it. I have just looked at my specimens. They are from Pont de l'Aube (Eure) and from Angoulême (Charente), and I have also one from Japan; they all have the white fascia." The evidence collected then by Mr. Rowland-Brown and myself "seems to suggest that the peculiarities noted in the Mendel series are not necessarily constant or distinctive of this particular locality," to quote Mr. Rowland-Brown. Only it does not yet appear that we have the type from the Tyrol, nor "*mendelensis*" from France or Switzerland; but in Austria, and Hungary, and perhaps Eastern Germany, this latter form is the prevailing one. — FRANK E. LOWE; Guernsey, Dec. 20th, 1904.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—Mr. Porritt, of Huddersfield, has contributed a number of species, chiefly from his district; also some beautiful specimens of *Agrotis ashworthii* reared from larvæ obtained in Wales in 1904.

MELANIC ASPILATES GILVARIA.—On July 25th last, while netting specimens of *Aspilates gilvaria* in the Warren at Folkestone, I took a female very strongly affected with melanism. On the upper surface the fore wings are of a smoky brown, with a slight ochreous tint, the transverse bar scarcely visible, and the central lunule completely lost in the ground colour. The hind wings are smoky white, clouded with brown towards the hind margin. The only part of the insect which is at all of the normal colour is the collar of the thorax. On the under side the transverse bar on the fore wings is rather more distinct and the lunule is also visible, but the hind wings are exceedingly striking, as they are dark brown (darker than on any other part of the insect), but inclining towards white at the base. As this is an insect fairly constant in its markings and colour, it occasioned me considerable surprise to meet with such a variation, especially in so southern a locality as Folkestone. All the other specimens I took were males, and strictly typical. The species appeared to be just out, and all I obtained, including the insect above described, were in excellent condition.—HUGH J. VINALL, 3, Priory Terrace, Lewes.

THE ENTOMOLOGICAL CLUB.—The meeting of this old-established association held at the Holborn Restaurant on Jan. 17th last was by far the largest that even Mr. Verrall, the chairman and host of the evening,

had presided over. The number we understand was eighty-four, including all but one of the eight members of the club.

In proposing "The prosperity of the Club," the chairman expressed his pleasure at seeing so many entomological friends but, he remarked, although the number present exceeded that at any previous meeting, he should not be quite satisfied until the total reached three figures.

We believe that the toast just referred to is not proposed at other assemblings of the club, and there seems to be one especially excellent reason that this should be reserved as a feature of the first meeting of the year, practically the "Annual" of the club. At one time this venerable institution, flourishing as it now is, came dangerously near extinction, and there is little doubt that had it not been for Mr. Verrall's strenuous, and eventually successful, efforts in the direction of obtaining a full complement of members, it would have collapsed some years ago. Other associations of a similar character might have arisen (even now the meetings of the Entomological Club are no longer unique), but the long line of these social réunions, connecting the past with the present, would have been severed, and this would have been regrettable from a sentimental point of view if for no other reason.

CAPTURES AND FIELD REPORTS.

LIMENITIS SIBYLLA IN AUGUST ?.—Mr. Gerard H. Gurney (Entom. xxxvii. 324) states that in the middle of August *L. sibylla* literally swarmed in forests near Boulogne. It would be interesting to hear whether Mr. Gurney can give any reason why this species should be out about two months later there than at the other side of the Channel. In the lower part of the Jura this year *L. sibylla* was out from June 18th to 23rd, I having a number of specimens taken by friends between those dates, which is about the time the species would probably be out in England.—E. E. BENTALL; The Towers, Heybridge, Essex, Dec. 29th, 1904.

LATE APPEARANCE OF PYRAMEIS ATALANTA. — Mr. Frohawk (*ante*, p. 25) notes the late appearance of *P. atalanta*. On Dec. 3rd last I saw one basking in the sun (which was very strong), on ivy, in Chiswick Mall, London; it was very fresh, and had the appearance of having only recently emerged. Being so late I had no box with me, or its capture would have been quite easy. I may here say that I have records of having seen *P. atalanta*, *V. polychloros*, and *V. urticae* in October, November, December, January and February; of course such cases cover a number of years, and they were hibernated specimens, enticed abroad by unusually genial weather. But the one seen last month was without doubt a very recent emergence and in faultless condition.—W. T. PAGE; 6, Rylett Crescent, Shepherd's Bush, W., Jan. 6th, 1905.

PYGÆA PIGRA IN SURREY.—In reference to your note on *Pygæa pigra* in Surrey (*ante*, p. 27), it may be of interest to mention that larvæ of this species were taken plentifully near Dormansland, on

dwarf willow, in the first week in September.—CUTHBERT JEDDERE-FISHER; Apsleytown, East Grinstead, 10th January, 1905.

A FEW CAPTURES FROM WYRE FOREST IN 1904.—During a week of bad weather in the middle of August, the following, amongst others, were taken:—*Heliophobus popularis*, *Luperina cespitis*, *Vanessa c-album*, *Agrotis suffusa*, *Noctua dahlia*, abundant; *N. neglecta*, abundant; *N. glareosa*, *Amphipyra pyramidea*, *Notodonta dromedarius*, *Minoa euphorbiata*. Amongst larvæ taken were: *Dicranura bifida*, *D. furcula*, *Platypteryx falcata*, *Demas coryli*, *Pæcilocampa populi*, *Cymatophora or*, *C. ocularis*, *Halias prasinana*, *Orygia gonostigma*.—W. A. ROLLASON; The White House, Truro, Cornwall.

THE SEASON OF 1904.—My work at Dorking this year compares favourably with that of 1903; several species were unusually abundant, and I took no less than seventeen that were new to me, as far as this locality is concerned. The first noteworthy entry in my diary is for April 4th, from which date until the 14th *Amphidasys strataria* was very abundant on the lamps, though not a single female was observed. On May 14th I took *Euchloë cardamines* for the first time, and this species swarmed until well into June. A single specimen of *Lycæna argiolus* was taken on May 14th, the only one I have seen in this neighbourhood for two years. *Nemeobius lucina* made its appearance on May 18th, and from then until the first week in June it was extremely abundant, its range on Ranmore and elsewhere appearing to have extended more widely than during previous years. *Pararge egeria* occurred sparingly from May 18th onwards, and *Syrichthus malva* was not nearly so abundant as in 1903. I took a nice series of *Phytometra viridaria* on May 19th and 28th, and on the latter date a very large specimen of *Notodonta dictæa* from a lamp. On June 1st *Eupithecia satyrata* was abundant, and on the 2nd I observed *Lycæna adonis* for the first time, though this species was not nearly so plentiful as it has been in former years. On June 3rd I was fortunate enough to take five examples of *Agrotis cinerea* from one lamp, but they were all males; and on June 5th I took *Notodonta trepida* from the same lamp. On this date also a nice brood of *Mamestra persicariæ* began to emerge; I had fed the larvæ during the autumn of 1903, on geranium. *Lithosia sororcula* was taken from a lamp on June 11th, and the first *Lycæna minima* was observed on the 17th. On the following day *Eurymene dolabraria* was beaten out of a blackberry-bush on Ranmore, and on the 27th a nice series of *Setina irrorella* was taken from long grass. On the 30th *Acontia luctuosa* was taken on the same ground, and a female deposited about fifty ova in the pill-box on the way home. *Emmelesia alchemillata* was taken from a lamp on July 1st, and on the 2nd a fine specimen of *Sesia myopæiformis* was taken, just after it had emerged from an old apple-tree in my garden early in the morning. Though I watched the tree carefully, however, I never saw another, and I only took one specimen from the same tree in 1903. On July 6th *Anarta myrtilli* was taken on Ranmore, and *Cidaria fulvata* was flying out of almost every bush. On the 8th some larvæ of *Smerinthus populi* went down to pupate, and the imagines emerged and died during my absence from home in August, as also did one specimen of *S. ocellatus*, which had gone down to pupate on July 15th.

This is the second time I have bred both these species in the late summer, the first having been already recorded in the 'Entomologist' (vol. xxxiv. pp. 229 and 258), and I was very much interested to read Mr. Richard Garratt's note in this month's issue (vol. xxxvii. p. 323) on the same subject, indicating that the two broods occur wild as well as in confinement. On July 12th *Aventia flexula* was beaten out, and on the 14th and 20th *Plusia moneta* was taken from the lamps. *Acronycta aceris* was taken on the 18th, and *Triphæna ianthina* on the 23rd. Larvæ of *Smerinthus tilia* went down to pupate on the 25th, but neither this year, nor previously, have the imagines appeared the same year. On the 25th also, a rather striking light variety of *Abraæas grossulariata* flew into my study window; and on the 27th and 30th *Hesperia comma* was to be seen in great numbers on Rammore. On these dates also, I beat *Lithosia deplana* and *Anticlea cucullata*, both of which were new to me. Also, on the 27th, I took a bleached specimen of *Epinephele ianira*, the under side being especially light. From this time until the middle of September I was away from Dorking, and so my next entry for this locality is Sept. 17th, when a brood of larvæ of *Hadena oleracea* began to go down; they had been feeding since July 26th. I did nothing of note during the rest of the year, except an occasional visit to the lamps, when I took *Xanthia citrigo* on Oct. 11th, and *Nonagria arundinis* on Oct. 12th. On Dec. 1st *Pacilocampa populi* was fairly abundant.

The new species taken by me in this locality this year are:—*Lithosia deplana*, *Drepana falcataria*, *Asphalia flavicornis*, *Leucania lithargyria*, *Nonagria arundinis*, *Xanthia citrigo*, *Anarta myrtilli*, *Eurymene dolabraria*, *Zonosoma pendularia*, *Asthena luteata*, *Bapta taminata*, *Emmelesia alchemillata*, *Eupithecia scabiosuta*, *E. lariciata*, *E. sobrinata*, *Melanippe procellata*, and *Anticlea cucullata*. Some of these, of course, are quite common things, but I had not taken them here before.—F. A. OLDAKER; Parsonage House, Dorking, Dec. 30th, 1904.

LEPIDOPTERA AT LIGHT IN REIGATE AND REDHILL, 1904. — During the past season I have worked the street-lamps in this district for Lepidoptera very regularly, and I think perhaps the following list of my captures may be of interest to some of my fellow-collectors. The electric arc lamps in the market-places of both towns were especially productive, *Stauropus fagi*, *Pheosia dictæoides* (fertilized female), *Notodonta trepida*, and *Ennomos fuscantaria* (37) being taken flying around these. I must add that I am indebted to Mr. Tongé, of Reigate, for the identification of many of the species. The date given is for the first specimen taken. *Sphinx ligustri*, July 5th. *Chærocampa elpenor*, June 20th. *C. porcellus*, July 8th. *Smerinthus tilia*, May 23rd. *S. ocellatus*, June 27th. *S. populi*, July 5th. *Ino statice*, July 27th. *Arctia caia*, July 27th. *Phragmatobia (Spilosoma) fuliginosa*, July 6th. *Spilosoma lubricipeda*, May 16th. *S. menthastri*, May 26th. *Hepialus humuli*, July 7th. *H. hectus*, July 1st. *H. lupulinus*, May 30th. *Cossus ligniperda*, June 30th. *Zeuzera pyrina*, July 27. *Porthesia similis*, June 28th. *Stilpnotia (Leucoma) salicis*, July 8th. *Dasychira pudibunda*, June 6th. *Pacilocampa populi*, Nov. 14th. *Malacosoma neustria*, July 27th. *Lasiocampa quercifolia*, July 27th. *Cilix glaucata*, June 3rd. *Dicranura vinula*, May 11th. *Stauropus fagi*, July 27th. *Pterostoma*

palpina, Aug. 9th. *Lophopteryx camelina*, July 5th. *Pheosia* (*Noto-donta*) *dictæa*, May 11th. *P. (N.) dictæoides*, May 18th. *N. ziecae*, May 14th. *N. trepida*, May 17th. *Phalera bucephala*, June 28th. *Thyatira derasa*, June 28th. *Bryophila perla*, June 30th. *Acronycta psi*, June 30th. *A. aceris*, June 28th. *A. megacephala*, June 29th. *Diloba cæruleocephala*, Oct. 10th. *Leucania conigera*, July 29th. *L. comma*, June 30th. *L. lithargyria*, July 8th. *L. impura*, June 30th. *L. pallens*, July 8th. *Gortyna ochracea*, Sept. 28th. *Hydræcia nictitans*, Sept. 2nd. *H. micacea*, Sept. 30th. *Axylia putris*, July 27th. *Xylophasia monoglyphæ*, June 15th. *X. lithoxylea*, July 5th. *X. sub-lustris*, July 29th. *Neuronina popularis*, Sept. 28th. *Cerigo matura*, Sept. 3rd. *Luperina testacea*, Sept. 8th. *Mamestra brassicæ*, May 18th. *M. persicaria*, June 30th. *Apamea gemina*, June 28th. *A. didyma*, June 11th. *Miana strigilis*, July 4th. *Grammesia trigrammica*, June 8th. *Caradrina quadripunctata*, Sept. 19th. *Agrotis puta*, Sept. 7th. *A. suffusa*, Oct. 11th. *A. segetum*, Aug. 8th. *A. exclamations*, July 8th. *A. strigula*, June 21st. *Noctua plecta*, July 5th. *N. c-nigrum*, Sept. 22nd. *N. brunnea*, June 28th. *N. xanthographa*, Sept. 8th. *Triphæna ianthina*, Sept. 2nd. *T. fimbria*, Nov. 1st. *T. orbona*, July 6th. *T. pronuba*, June 24th. *Amphipyra tragopogonis*, July 4th. *Mania typica*, June 24th. *M. maura*, June 8th. *Panolis piniperda*, April 30th. *Pachnobia rubricosa*, April 4th. *Taniocampa gothica*, March 24th. *T. instabilis*, April 9th. *T. stabilis*, March 31st. *T. pulverulenta*, April 4th. *Orthosia macilenta*, Nov. 1st. *O. litura*, Sept. 13th. *A. pistacina*, Sept. 19th. *A. lunosa*, Sept. 14th. *Cerastis vaccinii*, March 7th. *Calymnia trapezina*, Sept. 29th. *Scopelosoma satellitia*, Oct. 17th. *Xanthia fulvago*, Sept. 12th. *X. flavago*, Sept. 27th. *X. citrigo*, Aug. 17th. *X. gilvago*, Sept. 8th. *X. aurago*, Sept. 23rd. *X. circellaris*, Sept. 15th. *Cirr hædia xerampelina*, Aug. 30th. *Epunda lutulenta*, Sept. 28th. *Miselia oxyacanthæ*, Sept. 12th. *Euplexia lucipara*, June 24th. *Phlogophora meticulosa*, Sept. 14th. *Hadena oleracea*, July 5th. *H. genista*, July 29th. *Xylocampa areola*, April 7th. *Asteroscopus sphinx*, Nov. 29th. *Cucullia umbratica*, June 29th. *Gonoptera libatrix*, Sept. 11th. *Abrostola tripartita*, May 29th. *Plusia chrysitis*, June 29th. *P. moneta*, July 5th. *P. iota*, June 27th. *P. gamma*, May 27th. *Acontia luctuosa*, July 27th. *Hypena proboscidalis*, July 2nd. *Uropteryx sambucaria*, June 30th. *Rumia luteolata*, May 12th. *Metro-campa margaritaria*, June 27th. *Ellopiæ prosapiaria*, July 30th. *Pericallia syringaria*, June 28th. *Selenia bilunaria*, April 16th. *S. tetralunaria*, June 14th. *Odontopera bidentata*, May 26th. *Crocallis elinguararia*, Aug. 5th. *Ennomos alniaria*, Aug. 8th. *E. erosaria*, Aug. 22nd. *E. fuscantaria*, Aug. 9th. *E. quercinaria*, Aug. 16th. *Himera pennaria*, Oct. 18th. *Phigalia pedaria*, Jan. 11th. *Biston hirtaria*, May 10th. *Amphidasys strataria*, March 21st. *A. betularia*, May 14th. Var. *doubledayaria*, July 3rd. *Hemerophila abruptaria*, May 1st. *Boarmia repandata*, July 1st. *B. rhomboidaria*, June 28th. *Pseudoterpna pruinata*, July 5th. *Geometra vernaria*, July 6th. *Thalera (Iodis) lactearia*, June 16th.

Many species were taken belonging to the Ephyridæ, Acidaliidæ, &c., but these, I fear, are not yet accurately identified, all my time being taken with the larger species enumerated.

A few further notes on some of the species may perhaps be useful:—*N. trepida*, three were taken between May 17th and 23rd. *P. dictæoides*, eight were taken May 15th and 21st. *S. fagi*, one only, July 27th. *X. aurago*, three between Sept. 23rd and 27th. *X. gilvago*, eight during September. *C. xerampelina*, twenty-seven were captured between Aug. 30th and Sept. 23rd, but many of the latest specimens were very worn, and few were in good condition. *E. erosaria*, one only, Aug. 22nd. *E. fuscantaria*, abundant from Aug. 9th to Sept. 8th, and a few were taken even later in good condition.—A. J. WIGHTMAN; 28, Station Road, Redhill.

A LIST OF CAPTURES AT LIGHT, IN CLAPHAM, 1904.—Every species mentioned in the following list has been taken by myself, on shop windows within twenty yards of Stockwell Station, City and South London Railway.—*Smerinthus ocellatus*, several specimens, June and July. *S. populi*, common, June and July. *S. tiliæ*, rather scarce, June. *Earias chlorana*, six specimens, May 11th to 16th. *Arctia caia*, one female, July 3rd. *Spilosoma lubricipeda*, exceedingly common, June. *S. menthastri*, very common, June and July. *Hepialus hectus*, two dwarf specimens, June 11th. *Cossus ligniperda*, fairly common, July. *Zeuzera pyrina*, males common, females scarce, July 2nd to 24th. *Stilpnotia salicis*, a few specimens, August. *Dicranura vinula*, two males, June 3rd and 7th. *Cerura bifida*, two specimens, June 3rd, 1903. *Phalera bucephala*, very common, May and June. *Cymatophora duplaris*, one female, June 7th. *Bryophila perla*, several specimens, May, June, July. *Acronycta psi*, very common, June. *A. aceris*, very common, June to July. *A. megacephala*, very common, June and July. *Leucania pallens*, common, June. *L. impura*, slightly scarcer than former species, June. *Hydræcia nictitans*, two specimens, July 17th. *Axyliia putris*, common throughout June and July. *Xylophasia rurea*, one female, June 9th. *X. polyodon*, very common, June to August. *Apamea basilinea*, two specimens, June 15th and 17th. *Mamestra brassicæ*, one specimen, August 5th, usually common. *M. persicariæ*, common, June and July. *Miana strigilis*, fairly common, June. *M. fasciuncula*, eight specimens, June 15th to 20th. *Caradrina morpheus*, common, July 1st to 18th. *C. quadripunctata*, common, June and July. *Agrotis exclamationis*, very common, July to September. *A. nigricans*, rather scarce, July. *Noctua plecta*, very common, June to August. *N. triangulum*, one specimen, July 9th. *N. brunnea*, a few specimens in June. *N. festiva*, one male, July 7th. *N. xanthographa*, common, August to September. *Triphana fimbria*, three, common yellow form, July. *T. ianthina*, common, August 1st to 29th. *T. interjecta*, one male, August 3rd. *T. orbona*, occasional specimens throughout August. *T. pronuba*, fairly common, June to August 23rd. *Mania typica*, common, August. *M. maura*, a few to light, but commonest in side streets. *Calymnia trapezina*, one female, July 18th. *C. affinis*, one, August 1st. *Hecatera serena*, four specimens, July. *Euplexia lucipara*, very common, July to September. *Hadena chenopodii*, common, August 1st to 8th. *H. oleracea*, very common, June and July. *Abrostola triplasia*, one specimen, August 5th, usually common. *Plusia chrysitis*, fairly common, August. *Uropteryx sambucata*, common, July 15th to 29th. *Rumia cratægata*, very common,

May 16th to July 3rd. *Ennomos angularia*, one or two males, August 10th to 12th. *E. fuscantaria*, one male, August 29th. *Amphidasys betularia*, males common, females rare, June to August; var. *doubledayaria*, rather scarce, July. *Hemerophila abruptaria*, one dwarf specimen, July 11th. *Boarmia rhomboidaria*, males common, July 10th to 28th. *Acidalia aversata*, scarce, June and July. *A. incanaria*, fairly common throughout July. *Abraxas grossulariata*, common, July. *Hybernia defoliaria*, three males, November 13th, 14th and 15th. *Cheimatobia brumata*, one male, December 18th. *Eupithecia vulgata*, common, June and July. *E. centaureata*, three specimens, June. *Hypsipetes elutata*, fairly common, July. *Melanippe fluctuata*, very common, June to August.

This list is by no means exhaustive as regards all my London captures; it is simply a list of specimens obtained at light during last year. Many species mentioned in it as rare are to be captured commonly by other methods; as, for instance, *H. abruptaria*, of which I have only once taken a specimen at light, I find commonly on fences and walls. *B. hirtaria* still seems as common as ever on the trunks of the limes, and appears not to change its position for sun or wind; in fact, the only species of the seventy-one above mentioned that seems to get scarcer is *E. centaureata*. Ten years ago it would have been an easy matter to have taken twenty or thirty specimens by a cursory examination of the garden wall; gradually, however, it became scarcer, and at last seemed to die out. In fact, the three specimens recorded above are the only examples I have seen here for five years. I should be very grateful to any London entomologists who would inform me of captures of any species not mentioned in the above list.—B. STONELL, 25, Studley Road, Clapham, S.W.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, Jan. 18th, 1905.*
 —The 71st Annual Meeting, Professor Edward B. Poulton, D.Sc., F.R.S., the President, in the chair.—After an abstract of the Treasurer's accounts, showing a good balance in the Society's favour, had been read by Mr. R. W. Lloyd, one of the Auditors, Mr. Herbert Goss, one of the Secretaries, read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1905-1906:—President, Mr. Frederic Merrifield; Treasurer, Mr. Albert H. Jones; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander James J. Walker, R.N., F.L.S.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Mr. Gilbert J. Arrow, Lieut.-Colonel Charles Bingham, F.Z.S., Dr. Thomas A. Chapman, F.Z.S., Mr. James Edward Collin, Dr. Frederick A. Dixey, M.A., Mr. Hamilton H. C. J. Druce, F.Z.S., Mr. Herbert Goss, F.L.S., Mr. William John Lucas, B.A., Professor Edward B. Poulton, D.Sc., F.R.S., Mr. Louis B. Prout, Mr. Edward Saunders, F.R.S., F.L.S., and Colonel John W. Yerbury, R.A., F.Z.S. The President referred to the loss sustained by the Society by the deaths of the Treasurer, Mr. Robert McLachlan, F.R.S., Mr. Charles G. Barrett,

and other entomologists. He then delivered an address, in which he discussed the part played by the study of insects in the great controversy on the question, "Are acquired characters hereditary?" He argued that the decision whether Lamarck's theory of the causes of evolution is or is not founded on a mistaken assumption largely depends upon evidence supplied by the insect world, and finally concluded that the whole body of facts strongly supports Weismann's conclusions. At the end of his address the President urged that the study of insects is essential for the elucidation and solution of problems of the widest interest and the deepest significance. Professor Meldola, F.R.S., proposed a vote of thanks to the President and other officers. This was seconded by Mr. Verrall and carried. Prof. Poulton, Mr. Goss, Mr. Rowland-Brown, and Mr. Jones replied.—H. Goss, *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 8th, 1904.—Mr. Step in the chair.—Mr. Grosvenor, of Red Hill, Surrey, was elected a member.—Mr. Tonge exhibited some thirty-five species of British Lepidoptera, which he gave to the Society's collection.—Mr. Main, Orthoptera from Borneo and the Cape.—Mr. West, a specimen of the extremely rare coleopteron, *Tropideres sepicola*, taken by him in the New Forest in the summer of 1904.—Mr. Edwards, the parasitical bee, *Calioxys elongata*, from Blackheath, and read notes on its habits.—Mr. Dobson, series of *Geometra vernaria* and *Aglossa cuprealis*, which had come to light at dusk around his house at Maldon; the former sitting on leaves, and the latter resting in the curtains. *Plusia chrysis* had also been seen at light in the neighbourhood.—The remainder of the evening was devoted to an exhibition of lantern-slides by Messrs. Tonge (ova of Lepidoptera), Lucas (biological and botanical subjects), Goulton (lepidopterous larvæ), Step (lepidopterous larvæ), Main (resting positions of larvæ and imagines of Lepidoptera), and Dennis (flowering and seeding of trees and shrubs). Hy. J. Turner, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting was held in the Royal Institution, Liverpool, on December 19th, 1904, Mr. Robt. Tait, Junr., Vice-President, in the chair. Messrs. A. Bury (Newburgh), I. W. Horton (Mawdesley), and W. A. Rhodes (Liverpool), were elected members. Mr. Sopp, one of the Secretaries, read the Report of the Council, which showed that the past session had been one of the most successful in the history of the Society, and that the membership had increased by thirty-three. The Treasurer's Balance-sheet, presented by Dr. Cotton, showed a credit-balance at the bank and in the hands of the Treasurer of £12 13s. 7d. Certain alterations in the rules having been adopted, the following officers were elected to serve during 1905:—President: Saml. James Capper, F.E.S. Vice-Presidents: Professor T. Hudson Beare, B.Sc., F.E.S., F.R.S.E.; H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; Richard Wilding; F. C. Thompson; J. R. Charnley, F.Z.S., F.E.S. Treasurer: J. Cotton, M.R.C.S., F.E.S. Secretaries: E. J. B. Sopp, F.R.Met.S., F.E.S.; J. R. le B. Tomlin, M.A., F.E.S.; W. Delamere Harrison, Librarian: F. N. Pierce, F.E.S. Council: B. H. Crabtree, F.E.S.; J. F. Dutton; Wm. Mansbridge, F.E.S.; F. R. Dixon.

Nuttall, F.R.M.S.; C. E. Stott; H. R. Sweeting, M.A.; R. Tait, Junr.; A. Tippins; W. A. Tyerman, and W. Webster, M.R.S.A.I. The following were appointed Recorders:—Messrs. J. R. le B. Tomlin, M.A. (Coleoptera); Edwd. Saunders, F.R.S., F.L.S., F.E.S. (Hymenoptera); F. N. Pierce (Lepidoptera); C. R. Billups, M.R.C.S., and E. E. Lowe, F.L.S. (Diptera); W. J. Lucas, B.A., F.E.S. (Neuroptera); E. J. B. Sopp (Orthoptera), and Oscar Whittaker (Hemiptera). Mr. R. Tait, Junr., delivered an exhaustive address on "The Season 1904 lepidopterologically considered"; after which the undermentioned exhibits were shown:—*Boarmia repandata* (Penmaenmawr), *Aplecta advena*, *Nyssia lapponaria* (Rannoch), &c., by Mr. Tait; *Deilephila euphorbiae*, by Mr. J. Roxburgh; *Amara rufocincta* (Crosby), by Mr. R. Wilding; *Metæcus paradoxus*, *Melandrya caraboides* (Winlaton), *Stenostola ferrea* (Gibside), *Chrysomela orichalcia* var. *hobsoni* (S. Hylton), &c., by Mr. R. S. Bagnall; *Licrona cærulea*, L. (Grange), by Mr. O. Whittaker; a live specimen of *Acridium ægypticum* (Italy), by Mr. C. B. Williams; *Labidura riparia* (Liverpool), *Nyctibora holosericea* (Kew), *Schistocerca peregrina* (Birkenhead), and *Bruchus pisi* and *B. rufimanus* (Liverpool), by Mr. Sopp.—E. J. B. Sopp and J. R. le B. Tomlin, *Hon. Secretaries*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 17th, 1904.—Mr. S. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed *Callimorpha dominula*, L., from Devonshire larvæ, and mentioned his difficulties in breeding them. He found that whatever treatment he adopted, more than half were cripples. He also showed *Lasiocampa quercus*, L., bred from larvæ taken in Sutton Park in March and April. They included light and dark forms, the latter apparently var. *calluna*, Dalm. Amongst the dark ones were two which were very diaphanous, though the wings were perfect and the ciliæ unbroken, the outer third of each wing looked as if rubbed, owing to deficient scaling.—Mr. H. W. Ellis exhibited a collection of the Rhyncephora and allies; he gave a general account of the group, and then mentioned the local species, which included many that were rare, and numbered about 308 out of the 540 occurring in Britain.—Mr. R. C. Bradley showed *Thriplocera bicolor*, Meg., three specimens bred from larvæ of *Lasiocampa quercus*, L., from Sutton Park, taken in 1904 by Mr. W. H. Wilkinson.

November 21st, 1904.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau exhibited for Mr. H. Stone a collective cocoon made by some lepidopterous larvæ. Information was lacking as to its place of origin and the species which had caused it. It consisted of one large cocoon like a great brown nut, about 6 in. × 4 in., with a thick hard integument, containing a considerable number of ordinary brown cocoons massed together inside. The pupæ were empty, but there was no obvious means of exit, and the interior was closely packed with the material of the cocoons, so that it was not easy to judge how the moths had emerged.—Mr. R. S. Searle showed various Lepidoptera and foreign Coleoptera.—Rev. C. F. Thornehill read a paper upon "The Genus *Eupithecia*, especially in relation to Breeding them from the Larvæ." He had reared a considerable number of the species, and gave a general account of the larvæ, their

life-history, and a number of useful hints as to methods to be followed to find and rear the larvæ of various species. Mr. G. T. Bethune-Baker showed a number of British and continental specimens of the genus in illustration of the paper.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

MANCHESTER ENTOMOLOGICAL SOCIETY.—In the Manchester Museum, Owens College, on October 5th, 1904. — The President and Vice-President being unavoidably absent, the chair was occupied by Mr. R. Tait, Junr.—A paper was read by Mr. G. Kearey, entitled "Pupæ Digging and Collecting." — The following exhibits were shown by the members:—Mr. R. Brauer, Indian moths (family Chalcosidæ). Mr. G. Kearey, larvæ of *A. caia*. Mr. L. Krah, Lepidoptera, selected; specimens bred from continental ova—*L. dispar* (from Locarno), *S. menthastri*, *P. pigra*, *O. gonostigma*, *P. anachoreta* (from Bex), *P. rubricosa*, *P. trifolii* (from Bex), *S. populi* (British). Mr. C. F. Johnson, Lepidoptera from Torquay, North Wales, and Staffordshire—*L. cæsiata*, *T. opina*, *A. lunigera*, and *B. muralis*. Mr. A. Binns, specimen of *A. atropos* taken at Clayton, near Manchester, on Sept. 17th, 1904. Mr. W. Buckley, specimen of *A. ashworthii*, emerged Oct. 5th, 1904.

November 2nd, 1904.—Mr. R. Tait, Junr., presided in the absence of the President.—The meeting took the form of an exhibit evening, and the following specimens were shown by the members:—Mr. L. Krah, case containing exotic silk spinners, and including *P. cecropia*, *C. promethea*, *A. luna*, *T. polyphemus* (North America), *C. regalis* (South America), *A. pernyi* (China), *A. mylitta*, *A. cynthia* (India), *C. regina* (Japan). Mr. C. E. Bailey, the following silk moths (with cocoons and pupæ): *S. pyri*, *T. polyphemus*, and *A. cynthia*; *Vanessa antiopa*, with pupæ (Austrian form); *Thecla rubi*, male and female (Isle of Wight), *Mania maura* (Marple, Cheshire); *Euclidia mi* (Isle of Wight); *Arctia villica*, bred from larvæ taken at Eastbourne. Mr. J. Ray Hardy, larvæ, pupæ, and imago of *Calandria palmaria*. Mr. R. J. Wigelsworth, illustrations of larvæ and insect life. Mr. R. Brauer, Coleoptera from West Africa of the genus *Goliath*, *Ceratorhina*, &c.; Coleoptera from Transvaal and East Africa—Cetoniinæ, Elateridæ, Scarabæidæ, &c.; also Lepidoptera—*Apatura iris* var. *iole*, *V. antiopa* var. *hygiea*, *V. chelmys*, and Satyridæ (various) from Europe and Asia. Mr. W. Warren Kinsey, case containing preserved larvæ of British moths; cocoons of *E. lanestris*; larvæ and ichneumon cocoons of *M. typica*. Mr. R. Tait, Junr., *A. galatea*, *T. pruni*, *C. fulvata*, *M. rubiginata*, *P. bajularia*, *T. albicillata*, from Monkswood, 1904; *A. agathina*, a grand series, including some fine rosy forms, bred from Welsh larvæ, 1904; *E. lichenea*, from Welsh larvæ, 1904.

December 5th, 1904.—A very successful Conversazione was held in the Manchester Museum, Owens College, on the above date. Upwards of three hundred invitations were issued, the majority of which were accepted. Representatives from scientific and other societies in Manchester, Liverpool, Chester, and other towns, were present during the evening. Dr. W. E. Hoyle, addressing the company, extended to them a very hearty welcome. He was not only the Director of the Manchester Museum, but esteemed it a great honour to be the first President of the Society, the history of which was then briefly traced, from the first meeting in the Municipal School of Technology, Manchester, to the present occasion. The object and aims of the Society

were explained; also the advantages and privileges enjoyed by the members, some of which were, access to entomological collections, and use of the library. The Lepidoptera exhibited during the evening had been specially selected and laid out for inspection by Mr. J. Ray Hardy (who has the charge of the Natural History Department). He explained the more interesting details of the insects, of which upwards of seven thousand specimens were on view, the Manchester Museum, possessing one of the finest and most valuable public collections of Lepidoptera outside London. During the evening light refreshments were served; afterwards the visitors appreciated, to the fullest extent, all that had been prepared for their benefit and enjoyment. The following is the list of Lepidoptera exhibited (principally from the well-known "Schill" collection):—*Ornithoptera cræsus* (Batyan), *O. paradiseus* (North Guinea), showing sexual differences. *Papilio antimachus* (Africa), *P. sesostris* (South America), sexual differences. *P. ascanius* (Brazil), *P. coon* (Java), &c. *P. blumei*, *P. joesa*, *P. paranthus*, &c. *P. homerus* (Jamaica). *P. androcles* (Celebes) &c., showing development of hinder wing prolongations or "tails." *Teinopalpus imperialis* (India), *Armandia lidderdalii*, and their allies, showing the great difference in sex. The genus *Prioneris*. The genus *Dismorphia*: New World species of extraordinary coloration. The genus *Morpho*: mostly New World insects of great size and brilliancy. The genus *Acræa*: nauseous insects. The genus *Kallima* ("Leaf-butterflies"). The genus *Callicore* (the "88" butterfly). The genus *Callithea*: a New World group of perfectly opaque butterflies. Palæarctic Lepidoptera: Parnassiidæ and Coliadæ.—ROBERT J. WIGELSWORTH, *Hon. Secretary*.

RECENT LITERATURE.

1. *New Dragonfly Nymphs in the United States National Museum*. Proc. U.S. National Mus., vol. xxvii. pp. 685-720. 11 figs. and 7 pls. J. G. NEEDHAM. Washington, 1904.

A valuable addition to the excellent work done by Mr. Needham in this long neglected field of Entomology.

2. *The Labium of the Odonata*. Trans. Am. Ent. Soc. xxx. pp. 111-133. 7 plates. HORTENSE BUTLER. 1904.

A most useful addition to our knowledge of the highly specialised labium of the dragonfly nymph. The seven plates of details are excellent.

3. *The Skewness of the Thorax in the Odonata*. Journal of the New York Entom. Soc. Sept., 1903. J. G. NEEDHAM and MAUDE H. ANTHONY. Pp. 117-125, with a plate.

4. *The Phasmidæ, or Walking-sticks of the United States*. Proc. U.S. National Mus. Vol. xxvi. Pp. 863-885. 4 plates. A. N. CAUDELL. Washington, 1903.

Another of the useful monographs of groups of American insects that appear from time to time. The Phasmids, of which we have no single representative in Britain, are not numerous in the United States.

5. *An Orthopterous Leaf-roller*. Proc. Ent. Soc. Wash. Vol. vi. No. 1. A. N. CAUDELL.

6. *Oviposition and Carnivorous Habits of the Meadow Green Grasshopper* (*Orchelimum glaberrimum*). *Psyche*. Vol. xi. Pp. 69-71, with one plate. J. L. HANCOCK. 1904.

7. *The Leaf-hopper of the Sugar-cane*. Bulletin No. 1. Board of Commissioners of Agriculture and Forestry; territory of Hawaii. R. C. L. PERKINS. Pp. 38. Honolulu, 1903.

A full account of the insect and its natural enemies.

8. *Suppression and Control of the Plague of Buffalo-gnats in the Valley of the Lower Mississippi River*. Proc. 25th Ann. Meeting of Soc. for Promotion of Agric. Sci. Pp. 53-72; 7 figures and diagrams. F. M. WEBSTER. 1904.

An account of the insect and a review of its occurrence in the district.

W. J. L.

The Common Mosquitoes of New Jersey. By JOHN B. SMITH. New Jersey Agricultural Experiment Stations. Bulletin 171. Pp. 40. Plates 11, and other figures in the text.

Of the thirty-three species of Culicidæ occurring in the State of New Jersey, only three are unable to bite. Several others are confined to limited areas, and for one reason or another the number of noxious species considered of sufficient economic importance to be noticed in this bulletin is reduced to thirteen; three of these are members of the malaria-transmitting genus *Anopheles*

Who's Who? pp. 1796; *Who's Who Year-book*, pp. 128; and *The English-woman's Year-book*, pp. 368. London: Adam & Charles Black. 1905.

EACH of the above-mentioned annuals will be found of great interest to all whom they may concern, and this means a large section of the general public. The chief volume, *Who's Who?* comprises short biographies of many biologists, including specialists in various branches of Entomology whose names are familiar to most, if not all, of our readers.

We have also received the following:—

Analytische Uebersicht der paläarktischen Lepidopterenfamilien. Von C. v. HORMUZAKI. Pp. 68, with 45 figures in the text. Berlin: R. Friedländer & Sohn. 1904.

Ants and some other Insects. By Dr. AUGUST FOREL. Pp. 49. Chicago: The Open Court Publishing Company. London: Kegan Paul, Trench, Trübner & Co. Ltd. 1904.

An inquiry into the psychic powers of these animals, with an appendix on the peculiarities of their olfactory sense. Translated from the German by Prof. William Morton Wheeler.

A Treatise on the Acarina, or Mites. By NATHAN BANKS. Pp. 114, with numerous text-figures. (Smithsonian Institution. United States National Museum). Washington: Government Printing Office. 1904.

Entomologisches Jahrbuch. Kalender für alle Insekten-Sammler auf das Jahr 1905. Von Dr. OSKAR KRANCHER. Pp. 240, with one coloured plate. Leipzig: Frankenstein & Wagner. 1905.

THE ENTOMOLOGIST

VOL. XXXVIII.]

MARCH, 1905.

[No. 502.]

CRYPTIC FORM AND COLOURING IN *MELITÆA* LARVÆ.

By T. A. CHAPMAN, M.D.



THE larvæ of *Melitæa cinxia* and *M. athalia* when full grown are usually very conspicuous, still it has often struck me that, obvious as they are when you look for them—*i. e.* if they are not hidden away—you may easily pass by without seeing them, even though looking where they are, if not thinking of them. These larvæ considerably resemble the heads of *Plantago*; but this is still more the case with *Melitæa didyma*, whose yellow and brown markings make it very like a plantain-head with yellow stamens and brown scales.

This resemblance is brought out very well in the above reproduction of a photograph taken by Mr. H. Main of a larva of *M. didyma*—remarkably so since the assistance given by coloration is left out.

ENTOM.—MARCH, 1905.

G

A NEW SPECIES OF *NODARIA* FROM JAPAN
AND COREA.*NODARIA LEECHI*, sp. n.

Antennæ of male knotted and contorted about the middle. Primaries grey-brown tinged with lilacine, and with four transverse brown markings; antemedial and postmedial lines, the former slightly undulated, the latter rather wavy and curved round the end of cell; medial line broad, band-like, with a darker discal mark on it; submarginal line undulated, outwardly edged with whitish. Secondaries similar in colour to primaries and with two darker transverse lines, the outer one angled and outwardly edged with whitish below the middle. Expanse 24-26 millim.

Somewhat similar to *Nodaria fentoni*, Butl., but in the male separable therefrom by the knotted antennæ, and in both sexes by the different shape of the postmedial line. The secondaries also are darker in colour.

Described from a male specimen from Fusan in the National Collection at South Kensington, where also are a female specimen from Fusan and another from Gensan, one example of each sex from Tsuruga, and two males from Nagahama. All these were formerly in the Leech Coll., and were erroneously referred to *Nodaria fentoni*, Butl.

RICHARD SOUTH.

DESCRIPTIONS OF THREE NEW BEETLES FROM THE
GOLD COAST, AND ANGOLA, WEST AFRICA.

By E. A. HEATH, M.D., F.L.S.

ZOGRAPHUS LANEI, sp. n. (fig. 1).

Shining black; pronotum transversely striate, in alternate bands of pale ochraceous pubescence, and shining black. The head is shining black, rugose, with two curved lines of pale ochraceous pubescence on each side, the one at the base being much shorter than the anterior line. The antennæ are very slightly longer than the body; the basal joint is stoutest, and shorter than the head, rather coarsely granulated, the second joint being smoother, and nearly three times as long as the first joint; the remaining joints are shorter than the second, and about equal in length; the segments are bluish grey at their basal insertion, and black at the apical end. The elytra are thickly and coarsely punctured and sparsely pilose; the humeral angles are slightly produced forward; a broad band of pale ochraceous hair on each elytron about the centre reaching from the lateral margin to near the suture, a short narrow pale ochraceous transverse fascia on each side of suture, half-way between the white pale band and the base, and in a line with these on each side are irregular pale ochraceous marks at margin of elytra; near the apical margin of

each elytron is a short longitudinal fascia of pale ochraceous hair, and from the centre to apex are small irregular dots of the same colour; the apices of the elytra are fringed with black hair. The body beneath and the legs and tarsi are black, with pale ochraceous hairs. Long. 8 lines, max. lat. 3 lines.

Hab. Angola.

PROSOPOCERA BIPLAGIATA, sp. n. (fig. 3).

Shining brown, densely covered with pale brown pubescence. The pronotum is roughly sculptured, and has a tooth on each side, and the



1.

2.

3.

posterior margin transversely striated. The scutellum is rounded, tongue-shaped. The head, legs, and antennæ are the same brown colour; the latter are longer than the body; the basal joint stoutest, and twice as long as the head, rather rougher than the second joint, which is nearly twice as long as the first; the third joint is not quite as long as second joint, and rather longer than the fourth joint; the remaining joints are of equal length. The elytra are rather coarsely punctured, and densely shortly pilose; the humeral angles are slightly raised, and near them the basal area is blackly tuberculate; an irregular triangular white spot about the centre, broader at the lateral margin, which it does not quite touch, and its apex reaching to

near the suture. The body beneath is of the same brown colour, densely pilose, with a long white lateral fascia reaching from the base of the head, where it is broadest to the base of the mesosternum, where it is pointed; in some specimens this mark is only on the mesosternum, in others it is absent. Long. 12 lines, max. lat. $8\frac{1}{2}$ lines.

Hab. Angola.

PLECTROGASTER JORDANI, sp. n. (fig. 2).

Elytra brownish black, piceous, coarsely and thickly punctured, and having on each elytron four longitudinal carinate lines, which terminate 2 lines from the apex. The scutellum is rounded, tongue-shaped. Pronotum densely pilose; in the centre is a brownish black longitudinal fascia reaching from the head to the scutellum; on each side of this is a rich reddish fascia, also reaching from the head to the elytra, and on each side of this red mark is another brownish black one reaching from the head to just below the pronotal tooth, which is reflexed backward. The head is red, pilose. The antennæ are blackish brown, beautifully pectinate; the basal joint is red, small at its insertion and thickened at its apex, which is blackish; the lamellæ, nine in number, arise from the joints of the antennæ and are nearly equal in length (3 lines), except the first, which is a little shorter; the joints of the lamellæ form a serrature on the under side of antennæ. The body beneath and the legs are light shining reddish brown; the joints of legs are blackish. The middle and hind femora are pubescent, and the hind femur has a longitudinal groove underneath; the tarsi are blackish brown. Long. 20 lines, max. lat. 6 lines.

Hab. Gold Coast.

This insect comes very near to *P. pectinicornis*, Waterhouse, a female of which is figured in his 'Aid'; but it differs in some important respects. *P. pectinicornis* has blacker elytra, and the pronotum and head are wholly black; the femora are yellow, and black at their insertion, with black tibiæ and tarsi. The elytra and pygidium are pilose.

I am indebted to Mr. Horace Knight for the wonderfully fine drawings for the figures of the three beetles above described.

BIBLIOGRAPHICAL NOTES ON THE HEMIPTERA.

No. 4.

By G. W. KIRKALDY.

GENERAL NOTES.

1. Schaum's 'Bericht' gives the dates of the nineteenth Band of Herrich-Schæffer's 'Wanzenartigen Insecten' as follows:—Heft 1, 1849; hefte 2–6, 1850; heft 7 (Index), 1853.

2. In a review in 'Nature,' W. T. Blanford (Dec. 31st, 1903, vol. 69, pp. 199–201) objected to my new name for the bed-bug—viz. *Klinophilos*, one of the grounds being that it was already

the type of the Linnean genus *Cimex*. To this I replied, in the same journal (March 17th, p. 464), that the type of the Linnean *Cimex* could never be *lectularius*, as (1) Linnæus stated no types; (2) *lectularius* does not agree with the diagnosis of *Cimex*; and (3) another type for the latter genus was duly selected by Fabricius later on. Blanford replied on the same and following pages, stating that types of certain genera *were* fixed by Linné. As the information was, in part, new to me and several of my correspondents, I abstract it now. It would have been answered long ago had I not had a very bad accident while horse-riding, rendering me a cripple for over eight months (with the prospect of several more), and necessitating operations under chloroform (one more in a few days).^{*} Under these circumstances all my work has been greatly retarded, and I was unable to visit the only house in which 'Nature' was to be found (*then*) in Honolulu.

The "rules of Linnæus" were, according to Blanford, printed in his 'Philosophia Botanica,' a work not accessible to me now. Of these, Nos. 242 and 246 are quoted by Blanford:—

"242. *Nomen genericum Antiquum antiquo generi convenit.*

"246. *Si genus receptum, secundum jus naturæ et artis in plurā dirimi debet, tum nomen antea commune manebit vulgatissimæ et officinali plantæ.*"

There are several comments to be made on this:—

(1) The 1758 edition of the 'Systema Naturæ' is universally regarded as the foundation of entomological nomenclature, and there is nothing there of such rules, nor is there any mention, in the Introduction, of the 'Philosophia Botanica.'

(2) Even admitting these rules for Vertebrata, it is well known that many of the insects known to the ancients are incorrectly identified at the present day. Linné himself fell, apparently, into gross error; for example, *Chermes*, *Ichneumon* (not an insect), *Empis*, *Tipula*, *Aphis*, &c.; and, personally, I would be very sorry to attempt to affix the types of any Linnean genera by those "rules."

There are, I believe, only two generic names which can be settled in this manner, viz. *Apis* (*mellifera*) and *Cimex*; but here another (and, as I believe, superior) factor comes into play—*lectularius* cannot be the type, because it is antagonistic to the generic diagnosis.

It is curious that not one, so far as I can trace, of Linné's entomological pupils paid any attention to this (impossible) rule of "commonest species," and that the best known, *i. e.* Fabricius, deliberately fixed on *bidens* as the type of *Cimex*.

As to *Clinocoris*, 1829, which I restored in place of *Klinophilos*, I am aware that the "substitution of one name for

[* The present article was received on January 9th, 1905.—Ed.]

another on the score of convenience is absolutely in defiance of the 'rule of priority,' but when the earlier name is found to have been wrongly accepted up to the present, it is, I think, obvious that such a substitution is not only convenient, but obligatory.

3. It may be noted, with reference to recent discussions, that Sherborn ('Index Animalium,' 1902) accepts Geoffroy's 1762 genera.

Fam. COCCIDÆ.

1. Fernald Cat., p. 54. *Lecaniodiaspis*; the original spelling of this was *Lecanodiaspis*, and the type is *sardoa*, not *dendrobii*, as stated.

2. A species omitted in Fernald Cat. (apparently) is *Coccus pruni*, Burmeister (May 28th, 1849), in *Zeit. für Zoologie*, p. 177, on *Prunus domestica*, Germany.

The diagnosis is as follows:—

"♂ viridi-griseus, albo farinosus, alis albidis; scutello parvo, binodoso; antennis pubescentibus, pedibus nudis gracilibus; abdominis segmento penultimo et antepenultimo bisetoso. Long. $\frac{3}{8}$ lin.

"♀ elliptica, viridigrisea, albo farinosa, capite magno in prothoracem postice producto; abdominis lateribus paululam depressis, segmentis duobus ultimis utrinque pilosis. Long. 1 lin."

This is followed by a long description in German.

3. The references to many of the Zehntnerian species are incorrect, being taken from separately paged reprints. At the present moment I can supply a correct reference only to the following:—

Aspidiotus sacchari caulis, Zehntner (July 15th, 1897), 'Archief voor de Java-Suikerindustrie,' v. p. 735-44, pl. viii.

Fam. CIMICIDÆ.

In the 'Entomologist' (August, 1903, p. 215), I stated that I had not seen the description of *Philia*, Schiödte. I have now been able to secure Kröyer's 'Naturhistorisk Tidsskrift,' Bind iv. (1842-3), and find that *Philia* is not a valid genus. In the 'Revisio critica specierum generis Tetyrae Fabricii, quarum exstant in Museo Regio Hafniensi exempla typica' (pp. 279-312) "*Philia m.*" is simply placed at the head of the descriptions of several species below the Fabrician nomenclature. On p. 281 Schiödte states that *Calliphara* and *Callidea* (sic) are preoccupied by *Calliphora*, Macquart, 1835, and *Calleida*, Dejean, Latr 1829, and that they form only one genus. On pp. 315-60 at the "Forhandlingler i det skandinaviske entomologiske Selskab, in which (on pp. 346-8) Schiödte discusses his own paper, and definitely states that *Philia* is proposed as a new name for the above mentioned genera. As neither *Calliphara* nor *Calidea* i

preoccupied, and as they form good genera, *Philia* cannot stand, and for "*Philia*, Stål nec Schiödte," I propose "*Schioedtia*, nn., type *senator* (Fabr.)."

2. To the same entry in the 'Entomologist' (1903, p. 215) add:—

SCHIÖDTE, 1842-3, Naturh. Tidskr. iv. p. 330. (δ) *Cephaloctenus*, unnecessary "emendation" for *Cephalocteus*, Dufour, 1834.

3. The reference to *Legnotus*, Lethierry and Severin (Cat. i. p. 78), is Kröyer's Naturh. Tidskr. (2), ii. p. 464.

Fam. NAUCORIDÆ (?).

1. Sherborn ('Index Animalium,' 1902, p. 647) cites a hemipterous genus, *Naucorinus*, Meuschen, 1778, Mus. Gronov. p. 69, with apparently (see p. 1146) no species mentioned. I have not seen the work recently, but believe the form is only used in the plural, and is rather of a tribal or sectional value. I would be grateful for any information.

ERRATA (ENTOM. xxx.).

"BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA.—No. 3."

Page 280, Fam. Pyrrhocoridae, delete "*Probergrothius*," n.n., for *Odontopus*. The latter is apparently not validly preoccupied.

Page 281, line 18, for "*techii*" read *t. echii*; line 23, for "1903" read 1803; lines 24 and 26, delete *Macrothyreus* and *Macrocephalus*; line 6 from bottom, for *Dakulosphaira* read *Daktulosphaira*; line 3 from bottom, for *Embolophora* read *Embolophpora*; line 2 from bottom, for *Gonionotus* read *Gonia-notus*; transpose marks to footnotes.

Page 282. The footnote refers to the spelling of *Phlæophthiridium* and *Rhizophthiridium*.

LEPIDOPTERA OF THE LINCOLNSHIRE COAST.

By A. E. GIBBS, F.L.S.

I HAD the good fortune to spend the month of July, 1904, at Theddlethorpe St. Helen, a little-frequented spot on the Lincolnshire coast. Our bungalow was situated on the top of the sandhills, which are of considerable height, and have been raised to protect the low-lying district eastwards of the wolds from the ravages of the sea. These sandhills, upon which most of my collecting took place, are covered with scrub, consisting chiefly of sea-buckthorn, dwarf elder, whitethorn, bramble, and similar

low bushes, the first named so greatly predominating that one soon became painfully familiar with its prickly spines. The seaward face of the sandhills is clothed with lyme-grass, marram, and other plants, which serve to bind the sand and keep it from being blown or washed away. *Tapinostola elymi* was here to be found in almost unlimited numbers, while by searching among the lower-growing grasses a plentiful supply of *Nudaria senex* was obtainable. My lamp, however, attracted the attention of the coast-guard officers, who warned me that a moving light on this flat coast was apt to be attended with danger to shipping, and courteously requested me to keep on the other side of the hills. Long series of both the species mentioned were secured, but in the case of *T. elymi* the specimens were for the most part rather worn, owing doubtless to their habit of clinging to the swaying heads of the lyme-grass, and so getting blown against the surrounding herbage. On the day of arrival at the bungalow the first consideration was to find a suitable spot for sugaring. The district being almost treeless, advantage had to be taken of the posts of the wire fence which surrounded our little enclosure, and of the thicker stems of the buckthorn and other shrubs, while some clumps of thistles just coming into flower proved excellent objects on which to spread the alluring sweets. Among the moths obtained in limited numbers at sugar were *Lithosia complana*, *Axylia putris*, *Xylophasia sublustis*, *Neuria reticulata*, *Mamestra albicolon*, *Agrotis vestigialis*, *A. aquilina*, *Triphæna interjecta*, *Plusia festuæ*, *P. iota*, while any number of specimens of *Acronycta rumicis*, *Cerigo matura*, *Miana literosa*, *Agrotis tritici*, and *Hadena pisi* could have been obtained. Dusking yielded fair results. The most plentiful Geometer was *Acidalia imitaria*, which flew among the scrubs in considerable abundance, in company with *A. immutata*. Some elder-bushes in front of the bungalow appeared to have attraction for *Cleora lichenaria* and *Larentia viridaria*, the latter species greatly predominating. Light did not prove the success which was anticipated. A brilliantly illuminated sheet, placed in what appeared to be an excellent position, brought nothing but a few *T. elymi* and *L. viridaria*, and this method of working was therefore abandoned. The lights of the house, however, to some extent made up for the disappointment, and on several evenings the net was kept busy by the insects which came in at the open door. The most noteworthy visitor, so far, at any rate, as size was concerned, was *Odonestis potatoria*, of which there were often several males flying about at the same time. This is one of the familiar insects of the sandhills—the males at light and the females ovipositing among the long grass. On one particular evening, Saturday, July 16th, the bungalow was visited by a swarm of *Leucania impura*, which were flying about in large numbers, but curiously enough the experience was confined to

that particular night, though the insect was fairly common at sugar on other occasions. Several days were spent investigating the large woods a few miles inland, but so far as Lepidoptera were concerned the result was not very cheering. Burwell woods yielded only *Charæas graminis*, *Acidalia bisetata*, *Hyssipetes sordidata*, *Nomophila noctuella*, and *Sphaleroptera ictericana*. A visit to the "Greasy Field," near Louth, in company with Mr. C. S. Carter and Mr. Vincent Crow, two local entomologists, in search of *Melitæa aurinia*, which is recorded to occur there, and from which the field takes its name, proved fruitless, no signs of the presence of that insect being discernible, nor was a second attempt on a subsequent day any more profitable. A chalk-pit near by was carpeted with the yellow blossoms of *Hypericum perforatum*, from which *Catoptera hypericana* was beaten out in considerable numbers. The following is a list of the Lepidoptera observed at Theddlethorpe between July 1st and August 3rd:—

<i>Nudaria senex.</i>	<i>M. arcuosa.</i>	<i>A. immutata.</i>
<i>Lithosia lurideola.</i>	<i>Caradrina morpheus.</i>	<i>A. imitaria.</i>
<i>L. complana.</i>	<i>C. alsines.</i>	<i>A. emarginata.</i>
<i>Euchelia jacobææ.</i>	<i>C. taraxaci.</i>	<i>Cabera pusaria.</i>
<i>Hepialus humuli.</i>	<i>C. quadripunctata.</i>	<i>Larentia didymata.</i>
<i>Odonestis potatoia.</i>	<i>Rusina tenebrosa.</i>	<i>L. viridaria.</i>
<i>Thyatira derasa.</i>	<i>Agrotis vestigialis.</i>	<i>Eupithecia subfulvata.</i>
<i>Cymatophora octogesima.</i>	<i>A. suffusa.</i>	<i>Melanthia ocellata.</i>
<i>Acronycta psi.</i>	<i>A. segetum.</i>	<i>M. albicillata.</i>
<i>A. rumicis.</i>	<i>A. exclamationis.</i>	<i>Melanippe sociata.</i>
<i>Leucania lithargyria.</i>	<i>A. corticea.</i>	<i>M. montanata.</i>
<i>L. comma.</i>	<i>A. tritici.</i>	<i>M. fluctuata.</i>
<i>L. impura.</i>	<i>A. aquilina.</i>	<i>Cidaria dotata.</i>
<i>Calamia phragmitidis.</i>	<i>Noctua augur.</i>	<i>Pelurga comitata.</i>
<i>Tapinostola elymi.</i>	<i>N. festiva.</i>	<i>Aglossa pinguinalis.</i>
<i>Axylia putris.</i>	<i>N. rubi.</i>	<i>Pyralis glaucinalis.</i>
<i>Xylophasia rurea.</i>	<i>Triphana interjecta.</i>	<i>Scoparia mercurella.</i>
<i>X. lithoxylea.</i>	<i>T. orbona.</i>	<i>Herbula cespitalis.</i>
<i>X. sublustris.</i>	<i>T. pronuba.</i>	<i>Scopula olivialis.</i>
<i>Neuria reticulata.</i>	<i>Mania typica.</i>	<i>S. prunalis.</i>
<i>Cerigo matura.</i>	<i>Euplexia lucipara.</i>	<i>Crambus tristellus.</i>
<i>Mamestra sordida.</i>	<i>Aplecta advena.</i>	<i>Homæosoma nimbella.</i>
<i>M. albicolon.</i>	<i>Hadena oleracea.</i>	<i>H. nebulella.</i>
<i>M. brassicæ.</i>	<i>H. pisi.</i>	<i>Dictyopteryx læstingiana.</i>
<i>Apamea basilinea.</i>	<i>Plusia chrysitis.</i>	<i>Aspis udmanniana.</i>
<i>A. gemina.</i>	<i>P. festucæ.</i>	<i>Sericoris lacunana.</i>
<i>A. didyma.</i>	<i>P. iota.</i>	<i>Sciaphila conspersana.</i>
<i>Miana strigilis.</i>	<i>P. gamma.</i>	<i>S. virgaureana.</i>
<i>M. fasciuncula.</i>	<i>Cleora lichenaria.</i>	<i>Sphaleroptera ictericana.</i>
<i>M. literosa.</i>	<i>Acidalia dimidiata.</i>	<i>Catoptria hypericana.</i>
<i>M. bicoloria.</i>	<i>A. dilutaria.</i>	<i>Eupacilia atricapitana.</i>

SUPPLEMENTARY LIST OF THE LEPIDOPTERA OF
THE ISLAND OF CAPRI.—No. 2.

By C. SEYMOUR BROWNE.

In my previous supplementary list (Entom. xxxvii. pp. 186-188) twenty additions were enumerated. I now give twenty-two others.

NOTODONTIDÆ.

791. *Hoplitis milhauseri*, F.

NOCTUIDÆ.

1787. *Polia canescens*, Dup.

2005b. *Caradrina selini*, B., var. et ab *noctivaga*, Bell.

2068. *Tæniocampa stabilis*, View.

2188. *Xylomyges conspicillaris*, L., ab. *melaleuca*, View.

2199. *Calophasia lunula*, Hufn.

2221. *Cucullia verbasci*, L.

2391. *Eublemma suava*, Hb.

2417. *Thalpochares polygramma*, Dup.

GEOMETRIDÆ.

2958. *Acidalia dimidiata*, Hufn.

3008. *A. extersaria*, H.-S.

3008. *A. ochroleucata*, H.-S.

3020. *A. herbariata*, F.

3886. *Boarmia umbraria*, Hb.

4009. *Thamnonoma senticanaria*, Frr.

NOLIDÆ.

4110. *Nola chlamitulalis*, Hb.

ARCTIADÆ.

4208a. *Arctia villica*, L., ab. (et var.) *angelica*, B.

4208b. *A. villica* var. *konevkai*, Frr.

COSSIDÆ.

4685. *Hypopta cæstrum*, Hb.

PYRALIDÆ.

700. *Dioryctria abietella*, F.

1242. *Pyrausta sanguinalis*, L.

TORTRICIDÆ.

2055. *Notocelia uddmanniana*, L.

NEW SPECIES OF HYMENOPTERA (ACULEATA, ICHNEUMONIDÆ, AND BRACONIDÆ) FROM INDIA.

By P. CAMERON.

ACULEATA.

DIODONTUS RETICULATUS, sp. nov.

Niger, mandibulis late flavis; geniculis, tibiis tarsisque anticis flavis; alis hyalinis, nervis stigmatæque nigris. ♀. Long. fere 5 mm.

Hab. Deesa (Major C. G. Nurse).

This species comes near to *D. striolatus*, Cam., from Lahore. The two may be separated thus:—

Clypeus roundly and deeply incised in the middle; the base of the mesopleuræ without stout striations; the hinder tibiæ and tarsi testaceous	<i>striolatus</i> , Cam.
Clypeus not roundly and deeply incised in the middle; the base of the mesopleuræ with some stout striations; the hinder tibiæ only testaceous at the base	<i>reticulatus</i> .

Antennæ black; the flagellum with a pale microscopic pile. Head black; the front and vertex minutely and sparsely punctured; the face is thickly covered with silvery pubescence; the apex of the clypeus almost transverse. Mandibles yellow, their apical third black. Thorax shining; the base of the propleuræ with stout striations; there are two stout long oblique striæ behind the middle, and a shorter curved one behind these, almost in the middle; mesopleuræ with stout, widely separated keels on the basal half, which form irregular reticulations; the basal half coarsely aciculated, the apical smooth and shining. The base of the metapleuræ is smooth and shining; the rest bears oblique distinctly separated striæ. The base of the median segment bears stout oblique keels, which run into irregular reticulations in the middle; the apical slope is irregularly transversely striated; the fovea is large and deep. The four anterior tibiæ and the anterior tarsi are for the greater part testaceous; the base of the hinder tibiæ white; there are four longish spines on the hinder tibiæ, and there are three or four shorter spines on the apex on the outer side; the middle tibiæ are similarly but not so strongly spined. Abdomen smooth and shining; the apical half covered with a pale down.

CERCERIS SIMLAENSIS, sp. nov.

Black, largely marked with yellow, and thickly covered with white hair; the scape of the antennæ beneath yellow; the third joint and the base of the fourth rufous; legs yellow; the four anterior femora largely marked with black behind; the hinder pair with the apical two-thirds black; the basal area on the median segment stoutly longitudinally striated. ♂. Length, 10-11 mm.

Hab. Simla (Nurse).

Head black; the frontal spine, the face, the inner orbits to shortly above the base of the antennæ—the yellow line narrowed and rounded above—the clypeus, cheeks, and mandibles, except at the apex, yellow. Face strongly punctured; the clypeus is rounded at the top; its upper part convex, its lower with a semicircular depression in the middle; the apex black and transverse in the middle; the sides obliquely narrowed; both are black on the lower side. Vertex strongly punctured; the punctures distinctly separated; the front is much more closely and more minutely punctured, especially below where they run into striations. Thorax strongly and closely punctured, and thickly covered with white hair; there is a yellow mark—obliquely narrowed on the inner side—on either side of the pronotum, and the post-scutellum is yellow. The scutellum is more sparsely punctured than the mesonotum. The basal area on the metanotum is stoutly longitudinally striated; the rest of it is closely rugosely punctured, and is thickly covered with long white hair. Pleuræ closely but not deeply punctured, except the part below the hind wings, which is closely striated. Legs yellow; the four front femora above broadly at the base, slightly more than the apical half of the posterior, and a line on the outer and inner sides of the apical half of the hinder tibiæ, black; the hinder tarsi infuscated. Wings hyaline, the apex smoky; the stigma, the costa, and the basal nervures fulvous. The abdominal segments are lined with yellow on the apex; the last has an irregularly round mark on the sides. The pygidial area is strongly punctured, more sparsely in the middle than at the apex or base; the epipygium has a rounded incision in the apex; the fifth and sixth segments are, at the apex laterally, armed with bundles of stiff golden hair, the last being the thicker and longer, and looks like a stiff broad spine.

Come nearest to *C. himalayensis*, Bingham.

ICHNEUMONIDÆ.

CRYPTUS EXCAVATUS, sp. nov.

Niger; pedibus rufis; coxis trochanteribus femoribusque anticis subtus nigris; alis hyalinis, stigmate nervisque nigris. ♀. Long. 12, terebra 3 mm.

Hab. Simla (Nurse).

Antennæ entirely black. Head black; the inner orbits narrowly in the middle and the outer still more narrowly yellow. Face strongly and closely punctured, and thickly covered with white hair; the centre roundly projecting. Clypeus smooth, shining, and sparsely punctured. Front deeply depressed, smooth, closely and finely transversely striated; the part below the ocelli is coarsely irregularly transversely striated; the vertex near the ocelli is stoutly reticulated. Thorax closely rugosely punctured, more or less striated on the pleuræ and mesonotum. Scutellum shining and sparsely punctured. The median segment is more coarsely rugosely punctured than the mesonotum; the basal keel is less distinct than the apical; the teeth are broad. The mesosternal furrow is deep, curved, and does not reach beyond the middle. Legs rufous; all the coxæ and trochanters, the front femora to near the apex below and behind, the middle pair behind to near

the middle, the apex of the hinder narrowly, and of the tibiæ more broadly, black. Abdomen shining, the black with a bluish tinge. The wings have a slight fulvous tint.

A smaller and more slenderly built species than *C. luculentus*.

CRYPTUS LUCULENTUS, sp. nov.

Niger; pedibus rufis; coxis trochanteribusque nigris; alis hyalinis, stigmatate testaceo, nervis fuscis. ♀. Long. 17, terebra 5 mm.

Hab. Simla (Nurse).

Antennæ entirely black; the scape punctured and sparsely covered with short hair. Head black; the inner and outer orbits and a transverse mark on the middle of the clypeus near the apex, yellowish. Face closely and rather strongly punctured, and thickly covered with white hair; the centre is dilated broadly and roundly; the clypeus is more shining, and not quite so strongly punctured as the face. Mandibles black, rufous behind the teeth. Thorax closely and distinctly punctured; the pleuræ more strongly than the mesonotum. The punctuation on the sides and on the apical slope of the median segment run into reticulations, this being also the case with the metapleuræ. The base of the median segment is obliquely depressed in the middle; the basal transverse keel on it is interrupted in the middle, distinct on the sides, and projecting on the outer edge. Wings hyaline, with a slight but distinct fulvous tinge. Abdomen smooth; the middle segments aciculated. Legs rufous; the coxæ and trochanters black; the hinder tarsi have a yellowish tinge; they are distinctly spinose.

SPILICHNEUMON ANNULICORNIS, sp. nov.

Niger; pedibus, scutello abdomineque late rufis; annulo flagello antennarum, abdominisque apice albis; alis hyalinis, stigmatate nervisque nigris; apice tibiæ posticarum tarsisque posticis nigris. ♂. Long. 11 mm.

Hab. Simla (Nurse).

Antennæ shorter than the body, black, the flagellum brownish beneath towards the apex; there is a broad white band beyond the middle. Head black; the inner orbits and the sides of the clypeus broadly lemon-yellow; the centre of the clypeus has a rufous tinge. Face and clypeus closely punctured; the front and vertex are quite as strongly and closely punctured; the mandibles are broadly rufous near the middle. Thorax black, the scutellum yellow. Pro- and mesothorax closely and strongly punctured, and thickly covered with pale pubescence; the scutellum is not so closely punctured, and is covered with long pale hair. Median segment closely and strongly punctured, and thickly covered with longish white pubescence; the areola is twice longer than broad; the basal half is slightly but distinctly narrowed, its apex transverse; the sides are stoutly transversely striated, the centre aciculated; in the middle of the apical half is a longitudinal keel; the apical slope is closely irregularly rugose. Pleuræ closely, almost rugosely, punctured, the metapleuræ more coarsely than the rest. Legs rufous; the four anterior coxæ and the trochanters pale yellow; the hinder coxæ, the basal joint of the trochanters, the apical

third of the tibiae, and the hinder tarsi, black. Wings hyaline, the stigma and nervures dark fuscous. Abdomen black; the post-petiole, the second and third segments, and the sides of the fourth red; a large semicircular white mark on the apex of the sixth segment and the whole of the seventh white. The post-petiole is strongly but not very coarsely punctured: the gastrocoeli are narrow, dilated at the base; their outer side longitudinally striated.

(To be continued.)

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

In compiling this list of our local "Macro-Lepidoptera," I have kept strictly in view the necessity of excluding any species I have had the slightest doubt about. I could have included several species on the authority of the late Mr. J. B. Hodgekin, who marked them in Newman's 'British Butterflies and Moths' as "probably occurring in the neighbourhood"; but, as I have no record of their actual capture, I have excluded them. That the list is far from complete I know, but I hope this will stimulate collectors to record the capture of anything new to the district, so that we may in the near future have a more complete one. I have to thank Mr. George Loxham, of Lancaster, for much valuable information; some of his records, extending over a period of forty years, are unique.

PIERIDÆ.

Pieris brassicae. — Common everywhere in June and July, and the second brood in August and September.

Pieris rapae. — Abundant: late May and June, and the second brood in August and September. A yellow form occurs occasionally.

Pieris nesi. — Abundant: late May and June, and the second brood in August and September. Some of the forms about Clougha Pike are marked with black scales, and the veins are broadly marked, showing a tendency to melanism.

Pieris tussardae. — Uncommon about Lancaster. Odd specimens at Threlkirk and Thrisholme. Abundant at Witherslack and Brierley in May and June.

Pieris tussardae. — Local. Fairly common at Methop and Brierley in April and May. No second brood has been recorded.

Pieris tussardae. — Very rare generally; in "edusa years" we frequently have taken this species (in 1900) at Hest bank. I have taken a specimen the following year flying over a field near Hest bank. "In 1892 I took several examples near Hest bank and a few near Methop bank" (G. Loxham). No other specimens have been captured, as far as I know.

Gonepteryx rhamni.—Rare about Lancaster, fairly common at Arnside, and abundant at Witherslack in late July, August, and September.

NYMPHALIDÆ.

Argynnis selene.—Formerly common near Clougha Pike; now extinct there. "Up to a few years ago it occurred commonly in a rough field near Witherslack, but cultivation has stamped it out in that locality" (G. Loxham). The imago appears in June.

A. euphrosyne.—Common near Warton, Carnforth, on Arnside Knott, and near Grange-in-Cartmel, in early June.

A. aglaia.—I took a specimen in July, 1901, near Hest bank. Common at Warton, Arnside, and Witherslack.

A. adippe.—Fairly plentiful at Warton; common at Arnside and Witherslack in July and August. "I took a fine aberration of this species some years ago on Arnside Knott" (G. Loxham).

A. paphia.—I took a specimen at Witherslack on August 3rd, 1901—a record (*vide* 'Entomologist,' vol. xxxiv. p. 253).

Vanessa polychloros.—One specimen taken by me at Witherslack, July 24th, 1901 (*vide* 'Entomologist,' vol. xxxiv. p. 245—"The Butterflies of the Witherslack District," contributed by me in September, 1902).

V. urticae.—Abundant everywhere in early May and in September. Although we rarely get aberrations of this species, I took one at Arnside in August, 1903, and another in Grimshaw Lane three days later.

V. io.—Uncommon about Lancaster. Odd examples near Clougha Pike, Quernmore, Grimshaw Lane, &c., in August. Abundant about Witherslack and Arnside. This species is apt to vary; though such aberrations are rare, I have a Witherslack example, taken in 1901, without the "eye" markings on the hind wings.

Pyrameis atalanta.—Fairly common in some seasons, scarce in others. Lancaster, Methop, Witherslack, Arnside, Halton, &c., in July, August, and September.

P. cardui.—Uncommon generally; in some years (as in 1903) fairly plentiful. Lancaster, Arnside, Silverdale, Witherslack, &c., in August and September. "I used to take the larva feeding upon *Cnicus*, annually, at Heysham some years ago" (G. Loxham).

Erebia athiops.—Plentiful at Arnside and Witherslack in August.

Pararge egeria.—"Fairly common near Witherslack some years ago" (G. Loxham). This species is now extinct in this district.

P. megara.—Common near Sline, Heysham, Warton, Methop, and Witherslack in late May and June, and the second brood in August.

Satyrus semele.—Common at Arnside and Witherslack in July and August.

Epinephile ianira.—Abundant everywhere in June and July.

E. tithonus.—Very local, near Overton. "Formerly common about Heysham Moss in July" (G. Loxham).

Aphantopus (E.) hyperanthus.—"Formerly common in Maud's Wood, near Grange-in-Cartmel, in July and August" (G. Loxham). This species has not been taken in this district for the last few years, and is probably extinct.

Canonympha typhon.—The type does not occur here. On the

mosses at Witherslack, Methop, and Heysham, the var. *rothliebi* is abundant in June and July.

C. pamphilus.—Abundant everywhere in June, July, and August.

LYCENIDÆ.

Zephyrus (Thecla) betulæ.—Very local and scarce near Silverdale in late August and September. "Common near Silverdale, formerly" (G. Loxham).

Z. (T.) quercus.—Fairly common on Arnside Knott in July and August.

Callophrys (T.) rubi.—Abundant near Clougha and Quernmore; common at Methop in April, May, and June.

Chrysophanus phlæas.—Fairly common in Grimshaw Lane, near Clougha, Blea Tarn, Arnside, Witherslack, &c., from June to September.

Lycana ægon.—Locally common at Witherslack in August.

L. agestis.—Common at Arnside, Methop, &c., in May, June, and July. The var. *salmacis* occurs occasionally at Warton and Arnside, and the var. *allous* at Arnside fairly commonly.

L. icarus.—Common everywhere in June, and the second brood (often very diminutive in size) in September.

L. corydon.—"Common about Arnside Tower some years ago. Common near Warton in 1892" (G. Loxham).

L. minima.—Very local near Witherslack early in June.

Cyaniris (L.) argiolus.—Common about Grange, Methop, and Witherslack in late May and early June. No second brood occurs in this district.

ERYCINIDÆ.

Nemeobius lucina.—Very local near Grange and at Witherslack in late May and June.

HESPERIADÆ.

Thanaos (Nisoniades) tages.—Plentiful at Arnside and Witherslack in May.

Augiades (Hesperia) sylvanus.—Fairly common near Methop and Arnside in May and June.

SPHINGIDÆ.

Acherontia atropos.—Scarce, although odd specimens are captured nearly every year in July, August, and September. The larvæ have also been taken feeding on potato occasionally.

Sphinx convolvuli.—Rare. I took two specimens in August, 1900, and had another brought to me by a gardener, who found it at rest on a fuchsia; and on August 28rd, 1902, I found a specimen on a gate near Halton. I have only one record of the larva being found on bindweed (*Convolvulus arvensis*) on July 19th, 1900, near Quernmore.

Deilephila galii.—The larvæ are rare at Heysham on *Galium* in September.

Charocampa celerio.—Very rare. Mr. John Ralph has a specimen, taken in Lancaster some years ago; and on July 28th, 1898, I had a small male brought to me by our electrician.

Metopsilus (C.) porcellus.—I took two specimens at Quernmore in June, 1901, and have seen it on the wing near Clougha. "It occurs on the Witherslack and Methop Mosses" (G. Loxham).

Smerinthus ocellatus. — This species occurs near Hest bank, but I have only taken larvæ there; at Witherslack the shallows growing by the sides of the mosses are prolific hunting grounds for the larvæ in July.

S. populi. — Common everywhere: imago in June, larvæ in July and August.

Macroglossa stellatarum. — "Common at Arnside, Methop, and Witherslack in May" (G. Loxham).

Hemaris (M.) fuciformis. — "Rare near Methop bank in late May" (G. Loxham).

H. (M.) bombyliiformis. — "Occasionally about the mosses at Witherslack and near Methop bank in late May" (G. Loxham).

SESIDÆ.

Trochilium erabroniformis. — Common in the County Asylum grounds on sallow trunks in late June and July. Occasionally at Heysham and Hornby.

ZYGENIDÆ.

Ino statites. — Very local near Witherslack in late June and early July.

Zygæna filipendulæ. — Local, but abundant near Grange in July.

CYMBIDÆ.

Hylophila prasinana. — Not common; Grimshaw Lane, County Asylum grounds, near Quernmore, &c., end of May. I have bred this species from Witherslack and Methop larvæ.

NOLIDÆ.

Nola cucullatella. — Local; Freeman's Wood, Lancaster, in July.

ARCTIADÆ.

Nudaria mundana. — Not common, but generally distributed. Blea Tarn, Quernmore, County Asylum grounds, &c., end of July.

Cybosis (Lithosia) mesomella. — "Uncommon near Scotforth and at Witherslack in July" (G. Loxham).

Lithosia lurideola. — Common at Witherslack and Arnside in July.

L. sericea. — Local at Witherslack in mid-July.

Enistis (Gnophria) quadra. — "Two examples attracted to light near Lancaster, July, 1902" (G. Loxham).

Hipoerita (Euchelia) jacobææ. — Abundant at Witherslack and Methop, less so at Warton, in June.

Diacrisia (Nemeophila) russula. — Fairly common near Quernmore and Clougha, common on the Witherslack and Methop Mosses in July.

Parasemia (N.) plantaginis. — Common at Witherslack, near Quernmore, and Clougha in July and early August.

Arctia caia. — Common everywhere in July.

A. villica. — "Rare. Two specimens were taken in Ridge Lane, near Lancaster, in June, a few years ago" (G. Loxham).

Phragmatobia (Spilosoma) fuliginosa. — Rare at Heysham; common near Clougha and Methop bank, end of June.

Spilosoma mendica. — Common; Freeman's Wood, Lancaster (generally), Quernmore, &c., in June.

COMMON EVERYWHERE in June.
 Generally distributed.
 I have only taken this species near
 the coast of Devon.

(To be continued.)

NOTES AND OBSERVATIONS.

MACLESTES LEXNATA.—The larva noted (*ante*, p. 5) as having been brought into a warm room, fed up rapidly, and was early an inch long. When it made its cocoon (about an inch long, much shortened this, and made it broader, by what expedients I do not know, nor how it made a further improvement. The larval case was very shabby, being covered with leaves of *Lemna*, mostly dead and discoloured. The cocoon (an inch and 10 wide) is now covered by bright fresh green mosses, so far as regards the portion above water, and, being convex and prominent, it now looks just like the weed *Utricularia*.—F. A. CHAPMAN; Betula, Reigate, Feb. 4th, 1905.

THE APPEARANCE OF LEPIDOPTERA IN CONNECTION WITH THE CLIMATE.—The question of the time of appearance of the butterflies, raised by the notes of Messrs. Gurney (*Entom.* xxxvii. 62), is one of wider interest than may at first appear. The whole subject of the appearance of species in connection with the two factors of climate requires collating and discussing. I regret that I cannot do this myself, but I beg to communicate two personal contributions to the discussion. Some years ago I was at the little village of Framzelle, near Cape Gris-Nez, in October, when the weather had become cold, and Lepidoptera had disappeared, the only butterfly found along the coast being *Pieris nympha*, which species was fairly common. On the occasion when this butterfly is taken in this country, it is, as far as records accurately, always taken some weeks earlier. In 1904, I was at Ballater, in Scotland. On the course of an evening walk by the banks of the Dee, I saw many *Pieris spartiata*, which was flying in profusion over the water. The flight lasted for about an hour, and was very early for Scotland. I was at the Strand, W.C., Feb. 1st, 1905.

THE APPEARANCE OF *CYANIRIS (LYCÆNA) ARGIOLOUS*.—During a visit to South Devon I paid a visit to Torquay on Aug. 1st, 1905, and was rewarded by the capture of a freshly-emerged *Cyaniris argiolus*. I had just previously taken *Cyaniris* (*Lycaena*) *argiolus*, one male *L. argiolus*, and one female *L. stellatarum*, and had seen *Colias edusa*, which was flying to the harbour from the bathing-cove, my first specimen being a dolly blue, which settled in the middle of

the road, and fell an easy victim to my net. When boxed, the insect elevated its wings over its back, and its true character was not then recognized. On our return to the boarding-house it was transferred to the killing-bottle, when it closed its wings round its body and revealed the fact that the right pair of wings were those of the male, and the left pair those of the female. The markings on the under side are quite normal. The abdomen appears to possess the characters of the female. The specimen is $1\frac{1}{2}$ in. in expanse. There was no opportunity of establishing evidence of the theory that these freaks occur in pairs, for the fellow one did not cross my path. I have collected for twenty-one years without having met with a gynandrous specimen, and this capture was in consequence especially pleasing to me. The weather that day was all that could be desired, the sun shining brilliantly in a cloudless sky, and the heat was intense.—C. GRANVILLE CLUTTERBUCK; Heathside, Heathville Road, Gloucester.

NOTES ON ODONATA.—Mr. H. M. Edelsten sends the following interesting notes on dragonflies in 1905:—*Sympetrum striolatum* and *Aeschna mixta*, South Devon, common, Aug. 19th to 30th; *Æ. cyanea* and *Æ. grandis*, Enfield, August; *Erythromma najas*, Enfield, several, June 10th; *Pyrrosoma nymphula*, Enfield and Epping Forest, June; *Ischnura elegans*, Enfield and Epping Forest, June, July, and August; *Agrion pulchellum*, Enfield, June; *A. puella* and *Enallagma cyathigerum*, Enfield, June, July, and August. He also received from the Norfolk Broads, *S. striolatum* and *Lestes sponsa*, Aug. 25th, Sept. 5th. On one occasion Mr. Edelsten was able to watch a female *E. cyathigerum* ovipositing. It descended below the surface and remained under water for nearly fifteen minutes. When it came up again it flew off and was at once seized by a male, *per collum*.—W. J. LUCAS; Kingston-on-Thames.

CAPTURES AND FIELD REPORTS.

VANESSA ANTIOPA IN SURREY.—I have a rather damaged specimen of the "Camberwell Beauty" butterfly, which was captured on August 29th, 1904, at Raynes Park.—W. SMITH; 46, Durham Road, Cottenham Park, Wimbledon, Jan. 3rd, 1905.

LYCÆNA BÆTICA IN CORNWALL.—I have much pleasure in recording the capture, near to Truro, of a female specimen of *L. bætica*. It was netted on August 2nd, 1904, by a young friend of mine, a schoolboy collector, who so far has only a very small collection of the commoner species of butterflies. He saw the insect in his garden hovering around a veronica-bush, which it quickly left for a fuchsia-tree in bloom, and from which he netted it. It was not until he boxed the insect that he thought it to be anything unusual. He kept it alive for a day or two, hoping to find me at home, but unfortunately I was away on my holidays. He therefore pinched the thorax in the old-fashioned way, and set the insect, which is now in my collection. Both the wings on the right side are a little split at the edges, and the fringe worn; otherwise it is in good condition, the under side being beautifully marked and

coloured. The tail-like appendages and antennæ are complete, but by the pinching of thorax to kill it only one leg remains. I am delighted, however, to have the specimen. Can you inform me whether there are any later records of the capture of this insect than those given in Barrett's 'British Lepidoptera,' published in 1893?—W. A. ROLLASON; The White House, Truro, Feb. 10th, 1905.

[In 1893 three specimens of *L. batice* were recorded in the 'Entomologist' for that year—a male on September 7th at Dartford; one at Hastings, also in September; and a specimen in Sussex, August 28th. Two examples were reported as occurring in England in 1899. One of these was recorded as taken at Tunbridge Wells on September 1st; the other was said to have been captured at Deal on September 16th (Entom. xxxii. p. 281).—ED.]

UNUSUAL DATES.—The following dates may be worth recording:—On Nov. 15th, 1904, a fine male specimen of *Colias edusa* was seen on the wing; on Jan. 25th, 1905, one example of *Cidaria psittacata* (*siderata*) was found at rest on a bank; and on Feb. 3rd, 1905, a specimen of *Rumia luteolata* (*cratagata*) was seen in a similar position. The latter is, I think, quite exceptional even for South Devon.—E. D. MORGAN; 8, Luscombe Terrace, Dawlish, Devon, Feb. 3rd, 1905.

[In the December number of the 'Entomologist' for last year there are two records of *C. edusa* having been observed in November. *C. psittacata* hibernates in the imago state. February is certainly an unusual date for *R. luteolata*.—ED.]

LEUCOPHLEA SURINAMENSIS LIND. IN ESSEX.—This pretty cockroach has occurred abundantly in a tanpit adjoining the greenhouses of a private garden between Chelmsford and Bloomfield, and is doing considerable harm to the pineapples, orchids, and other plants. In Mr. Burr's 'British Orthoptera,' published in 1897, the occurrence of two individuals at Bognor, Sussex, and one at Kew is mentioned, but Mr. Burr states that "it hardly deserves to be called British until it is proved that it actually breeds here." There is no doubt of its breeding in the present locality, as it has been established for several years, and the specimens brought to me are of every age and size, from recently hatched young to mature insects. The gardener who submitted the specimens to me does not know how they came, but in the past few years numerous tropical plants have been brought into the garden, and the cockroaches may have been brought with one of them. I have sent specimens to the British Museum Collection, and my naming has been confirmed there.—E. CHARLES HORRELL; County Laboratories, Chelmsford, Essex.

Since writing the above, I hear from Mr. W. H. Harwood, of Colchester, that about thirty specimens have recently been found near Liverpool and Manchester.—E. C. H.

A FEW CAPTURES FROM NORTH CORNWALL IN 1903.—The following insects, taken during July and August, may be worth noting:—*Argynnis aglata*, abundant and in grand condition; *Leucophasia sinapis*, including one of the pale variety; *Hesperia linea*, abundant; *Melanargia palata*, *Habrosyne derasa*, *Cymatophora duplaris*, *Emmelesia alchemillata*, *Triphaena interjecta*, *Hylophila quercana* (*bicolorana*), *Hypsipetes elutata*

beautiful vars. ; *Epione apiciaria*, common ; *Noctua baia* ; and a grand specimen of *Cidaria truncata* var. *comma-notata*, of the colouring described by "Newman."—W. A. ROLLASON ; The White House, Truro, Cornwall.

NOTES ON COLEOPTERA IN SOUTH-WEST SURREY.—*Claviger foveolatus*, Müll. In the nests of *Formica flava* under stones on the "Hog's Back."—*Chrysomela polita*, L. Occurred only once in the interior of a fallen tree on Peasmarsh.—*Oncomera femorata*, F. Abundant in the vicinity of Shackleford, on *Ægopodium podagraria*.—*Leistus spinibarbis*, F. Under refuse in a wood near Puttenham.—*Carabus intricatus*, L. Fairly plentiful during the summer months.—*Pterostichus nigrita*, F., *P. strenuus*, Daws. Widely distributed, but few specimens taken.—*Notiophilus palustris*, Duft. Occurred once or twice on Peasmarsh.—*Geotrupes sylvaticus*, Panz. One specimen taken in a copse near Compton.—*Clytus arietis*, L. On roses at Godalming.—*Meloë proscarabæus*, L., *M. violaceus*, Marsh. Occurred frequently on grassy banks.—*Zabrus gibbus*, F. Was taken only once in a field of standing corn at Shackleford.—*Anobium pertinax*, L. Plentiful in old willows on the banks of the Wey.—*Toxotus meridianus*, L. One specimen only crawling on a road.—*Bolitobius atricapillus*, F. Abundant in fungi.—*Callistus lunatus*, F. Under stones on the "Hog's Back."—*Apion pomonæ*, F. Abundant.—*Silpha rugosa*, L., *S. atrata*, L. Plentiful on dead animals.

I also did a little collecting among the water-beetles during the first fortnight in July. From Cuttmill ponds I obtained *Pelobius tardus*, Herbst ; *Agabus bipustulatus*, L. ; *Acilius sulcatus*, L. ; *Ilybius fuliginosus*, F. ; *Gyrinus natator*, Scop. ; *Cercyon flavipes*, F. ; *Dytiscus marginalis*, L. ; *Haliphus obliquus*, F. ; *Hyphydrus ovatus*, L. And from Losely, *Hydroporus palustris*, L. ; *Sphæridium bipustulatum*, F.—J. A. CROFT ; Charterhouse, Godalming, Surrey.

COLLECTING IN WEST CORNWALL DURING 1903-1904.—Omitting captures of the commoner species, the following may be interesting to record:—

1903. TRURO DISTRICT.—June : *Lycæna argus* (*ægon*), *Acidalia subsericeata*, *Eupithecia plumbeolata*. July : *Habrosyne detersa*, *Thyatira batis*, *Acidalia bisetata*, *Cymatophora duplaris*, *Bapta* (*Corycia*) *temerata*, *Melanippe galiata*.

NEWQUAY DISTRICT.—July : *Lycæna argus* (fairly abundant), *L. astrarche* (*medon*).

FALMOUTH DISTRICT.—July : *Melanippe galiata*. August : *Colias edusa* (scarce), *Vanessa cardui* (fairly common), *Epineuron* (*Neuron*) *popularis*, *Noctua rubi*, *Melanippe galiata*, *Agrotis suffusa*, *A. puta*, *A. obeliscæ*, *Triphæna interjecta*, *Noctua c-nigrum*, *Axylia putris*, *Miana literosa*. September : *Eupithecia centaureata*, *Heliothis armigera*, *Caradrina blanda*, *Aporophylla australis*, *Polia flavicincta*.

1904. TRURO DISTRICT.—May : *Rusina tenebrosa*. June : *Heliodes arbuti*, *Emmelesia alchemillata*, *Melanippe galiata*, *Æthia* (*Zanclognatha*) *tarsipennalis*, *Anticlea rubidata* (common), *Rusina tenebrosa*, *Eupithecia exiguata*, *E. castigata*, *Cymatophora duplaris*, *Acidalia subsericeata*. July : *Eupithecia tenuiata* (from larvæ taken in sallow-catkins in April),

Metrocampa margaritaria, *Ligdia adustata*, *Eupithecia rectangulata*, *Melanippe unangulata*, *Anticlea sinuata*. August: *Acidalia promutata*, *Xanthia silago* (from larvæ taken in willow-catkins in April). September: *Xylina rhizolitha*, *Colias edusa* (2), *Orthosia lota* (from larvæ taken in willow-catkins in April), *Polia flavicineta*.

ST. AUSTELL DISTRICT.—June: *Erastria fuscata*, *Tephrosia punctularia*. July: *Emmelesia alchemillata*, *Melanippe unangulata*, *M. rivata*, *Anticlea rubidata*, *Erastria fuscata*.

FALMOUTH DISTRICT.—June: *Anticlea rubidata*, *Emmelesia affinitata*, *Bapta* (*Corycia*) *temerata*, *Anticlea sinuata*. July: *Agrotis lunigera*, *Cleora glabraria*, *Emmelesia affinitata*, *Eupithecia rectangulata*. August: *Lasiocampa* (*Bombyx*) *quercus*, *Pyrameis* (*Vanessa*) *cardui* (numerous). This month were taken also larvæ of *Bapta temerata*, and in July larvæ of *Emmelesia affinitata*, *Dianthæcia capsophila*, *Eupithecia venosata*, *Macroglossa stellatarum*, and *Pieris napi*.

I should be glad to know if *Cleora glabraria* and *Anticlea sinuata* have been previously recorded from Cornwall.—W. A. ROLLASON; The White House, Truro, Cornwall.

[*Anticlea cucullata* (*sinuata*) has once been recorded from Cornwall. *Cleora glabraria* is known to occur in Devonshire, but, so far as we are aware, it has not been reported before from Cornwall.—ED.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 1st, 1905.*—Mr. F. Merrifield, President, in the chair.—The President announced that he had appointed Dr. Thomas Algernon Chapman, M.D., F.Z.S.; Dr. Frederick Augustus Dixey, M.A., M.D.; and Professor Edward B. Poulton, D.Sc., F.R.S., as Vice-Presidents for the Session 1905–6.—Mr. H. St. J. Donisthorpe exhibited specimens of *Oligota granaria* found in a granary in Holborn, the only other localities reported hitherto being Shoe Lane and Scarborough.—Mr. W. J. Kaye, a specimen of the Erycinid butterfly, *Mesosemia eumene*, pinned in its natural position of rest to show its resemblance to the head of a small mammal, such as a mouse.—Dr. T. A. Chapman, a variety of the female of *Lycæna melanops*. As a mere aberration it was interesting, but it was of value as showing that the position in the genus for long accorded to the species, whether by accident or design, close to the *Arion-Euphemus* group, was correct. The considerable extension of the blue in this specimen showed up certain black spots on the upper surface of both upper and lower wings, strictly similar to these characteristics of the *Arion-Euphemus* group. He had named the variety, which seemed to be undescribed, var. *wheeleri*, in recognition of the work done by the Rev. George Wheeler among alpine butterflies.—Mr. F. Enock, a living female *H. defoliaria*, taken as late as February 1st, at rest on north side of oak-tree, and another female taken January 28th in the same wood at Bexley. He also exhibited, on behalf of Mr. Leonard Newman, of Bexley, two fine hybrids bred from a male *Notodonta ziczac* and a female *N. dromedarius*, the colour being that of *dromedarius* while the markings were those of *ziczac*.—

Mr. O. E. Janson, a living specimen of *Acridium ægyptium*, L., found in a cauliflower in Bloomsbury, and probably imported from Italy.—Mr. G. C. Champion, two specimens of *Malachius barnevillei*, Puton, captured by Mr. Thouless at Hunstanton, Norfolk, in June, 1899, a recent addition to the British List.—Mr. H. W. Andrews, male and female examples of *Machinus rusticus*, Mg., a rare Asilid, taken in cop. at Freshwater, Isle of Wight, on August 18th, 1903.—Mr. W. J. Lucas, a female specimen of *Panorpa cognata* taken at Byfleet Canal on August 23rd, 1904. The species occurs at Folkestone, and is said to be found in the New Forest. For comparison he also exhibited female specimens of *P. communis* and *P. germanica*.—The following papers were read:—"A Revision of the Genus *Criocephalus*, with Notes on the Habits of *Asemum striatum* and *Criocephalus fesus*," by Dr. D. Sharp, M.A., F.R.S., and J. Gilbert Smith, Mr. Smith exhibiting specimens.—"Another Entomological Excursion to Spain" (with descriptions of two new species of Hemiptera by Dr. O. M. Reuter), by Dr. T. A. Chapman, M.D., and G. C. Champion, F.Z.S.—"On the Matrivorous Habit of *Heterogynis*," and "On the Pupal Suspension of *Thais*," by Dr. T. A. Chapman, the author exhibiting examples of *Heterogynis* from numerous localities.—"Notes on New Zealand Lepidoptera," by E. Meyrick, B.A., F.R.S.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—January 12th, 1905.—Mr. E. Step, F.L.S., Vice-President, in the chair.—The President referred to the death of Mr. C. G. Barrett, who had been a former President of the Society, and it was unanimously agreed to send a letter of condolence to Mrs. Barrett and family.—Mr. Main exhibited *Panorpa communis* and *P. germanica* from Folkestone.—Mr. Lucas, *P. cognata*, the rarest British scorpion-fly, and the other two species for comparison, with a female of the latter taken during the field-meeting at Byfleet on July 23rd. He also showed *Chrysopa ventralis*, from the same locality.—Mr. Goulton, photographs of lepidopterous larvæ.—Mr. Joy, varieties of *Aphantopus (Epinephela) hyperanthus* (1) with white ocelli on the upper side of the hind wing; (2) with the ocelli on the under side wholly or partially reduced to mere dots = var. *arete*; and (3) with elongate ocelli on the under side = ab. *lanceolata*.—Mr. R. Adkin gave an account of the Annual Meeting of the South-eastern Union of Scientific Societies, which he attended as the Society's delegate. He also read the report of the field-meeting held at Eynsford on June 25th, 1904.—Mr. Lucas read the report of the field-meeting at Byfleet on July 23rd, and then showed a number of lantern-slides illustrative of protective resemblance, kindly lent him by Mr. Hamm, of the Hope Museum, Oxford.—Messrs. Dennis, Clark, Lucas, Step, Tonge, and West also exhibited various slides.

January 26th.—Mr. Sich, F.E.S., President, in the chair.—Annual General Meeting.—The first part of the meeting was devoted to the business of receiving the Treasurer's balance-sheet and statement; the reading of the Council's report for the past year; the announcement of the Officers and Council elected for the ensuing year; and the reading of the retiring President's address. A satisfactory financial condition was announced by the Treasurer, Mr. T. W. Hall, and the Council's report showed that the work of the Society had been generally successful throughout the year, with an average attendance

at the twenty-five meetings of over thirty. A list of the elected Officers and Council:—President, Hugh Main, B.Sc., F.E.S.; Vice-Presidents, A. Sich, F.E.S., and E. Step, F.L.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dodds; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., F. Noad Clark, F. B. Carr, A. Harrison, F.L.S., F.Z.S., F.C.S., W. J. Kaye, F.E.S., H. A. Sauze, and W. West (Streatham).—Ordinary Meeting: Mr. Hugh Main, B.Sc., President, in the chair.—Dr. Chapman exhibited a living specimen of *Doritis apollinus*, bred from a pupa sent from Syria.—Mr. Step, a further portion of the "Tugwell" herbarium.—Mr. Main reported having seen *Hybernica rupicaprararia*, *Phigalia pedaria*, *Cheimatobia brumata*, *H. marginaria*, and *P. monodactylus* in Epping Forest in some numbers on Jan. 22nd.—Mr. Turner read a few notes on the Entomology of Assiniboia, Canada, received from Mr. A. J. Croker.—Hy. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The first ordinary meeting of the session was held in the Royal Institution, Liverpool, on Monday, January 16th, 1905.—Mr. Wm. Webster, M.R.S.A.I., in the chair.—The Rev. Chas. E. G. Kendall, B.A., Ripon Street, Preston, and Mr. Albert Wade, F.E.S., Frenchwood Street, Preston, were elected members of the Society.—Donations to the Library were reported by the Secretary from Messrs. H. St. J. K. Donisthorpe, F.Z.S.; J. R. Charnley, F.Z.S., and H. B. Score, F.R.G.S.—The chairman announced that the Council had decided to hold a microscopical and lantern meeting in March, when it was hoped that as many members as possible would contribute to make the innovation a success.—This completing the business, a paper was communicated by Mr. E. J. B. Sopp, F.R. Met. Soc., on the "Orthoptera of Lancashire and Cheshire."—A paper was then read by Mr. H. B. Score, F.R.G.S., F.R. Hist. S., on "Ants and their Ways," which was copiously illustrated by lantern slides. In opening, the lecturer treated interestingly and fully of the general external anatomy of the ant, afterwards discoursing on the uses of the various organs described, and shown on the screen. He then reviewed the habits of some of the better-known insects, and enlarged on the life-histories of such well-known species as the "Driver Ants" (*Anomma arceus*) of West Africa, the "Grain Storing Ants" (*Atta barbara*), of Palestine, &c., the "Parasol Ants" (*Ecodoma cephalotes*), "Agricultural Ants" (*Atta malefaciens*), and others. Passing to a consideration of *Formica rufa*, *F. fusca*, *F. sanguinea*, *Myrmica ruginodis*, and other British species, he recapitulated what is known regarding the habits and life-history of the various species, and mentioned that he had for many months had under observation, in a Lubbock formicarium, a nest of our common black house ant, *Lasius niger*.—On the motion of Dr. Cotton, seconded by Mr. Oulton Harrison, a hearty vote of thanks was accorded the lecturer.—Amongst exhibits shown were a beautiful series of slides of larvæ by Mr. J. J. Richardson: *Acronycta leporina*, *Anarta myrtilli*, *Liparis salicis*, *Fidonia atomaria*, *Cænonympha davis*, &c., by Dr. Cotton, and *Periplaneta americana* and *Leucophæa surinamensis*, from the Liverpool Docks, by Mr. Sopp.—E. J. B. SOPP and W. B. HARRISON, *Hon. Secs.*

THE ENTOMOLOGIST

VOL. XXXVIII.]

APRIL, 1905.

[No. 503.]

DESCRIPTIONS OF TWO NEW BEETLES FROM ANGOLA.

By E. A. HEATH, M.D., F.L.S.

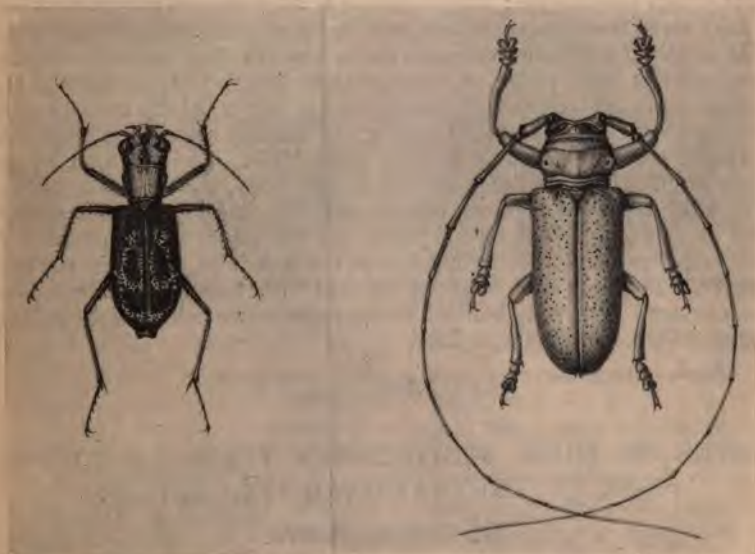


FIG. 1.

FIG. 2.

Fam. CICINDELIDÆ.

OPHRYODERA DISTANTI, sp. n. (Fig. 1.)

Head, pronotum, and elytra piceous, varying in some specimens to coppery brown; elytra coarsely punctured with very pale ochraceous irregular and indistinct marks from a little above the centre to the apex, where they form an irregular submarginal band. The head, face, pronotum, and pygidium are covered with brownish white hairs. The antennæ are piceous, except the first three joints, which are purple; the first joint is much thicker than the second, which is twice

longer; the third joint is half as long as the second. The body beneath is shining black, except the pro- and mesonota, which are green and coppery. On each side of the head, thorax, and abdomen is a band of white hairs reaching to the pygidium. The femora are bluish coppery black, and densely covered with white hairs; the tibiæ are bluish black, and slightly less hairy; the posterior tibiæ are longer than the tarsi; all the tarsi are purple, with white hairs at the joints.

Var. *a*.—Elytra with only a few white spots.

Var. *b*.—Elytra spotless.

Var. *c*.—Elytra coppery brown.

Long. 12 lines, lat. 4 lines.

Hab. Angola.

Fam. CERAMBYCIDÆ.

PROSOPOCERA ROTHSCILDI, sp. n. (Fig. 2.)

Head, pronotum, scutellum, and elytra densely covered with short pale brown pubescence; the pronotum is slightly sculptured, and has a very short tooth on each side, and a black puncture on the upper side in a line with and near each tooth, and one just under the tooth, the anterior and posterior margins are transversely striated; the scutellum is tongue-shaped; the elytra are rather thickly covered with black punctures, the humeral angles are slightly raised and produced forward, the basal area is blackly tuberculate. The antennæ in the male are nearly three times as long as the body, and covered with a fine silky lavender-coloured pubescence; the basal joint is stoutest, and half as long as the second joint; all the remaining joints are of the same length as the second, except the last joint, which is slightly longer. The legs and tarsi are covered with pale lavender-coloured pubescence. The body beneath is the same brown colour as the elytra. Long. 15 lines, max. lat. 6 lines.

Hab. Angola.

NOTES ON SOME STEPHENSIAN TYPES OF TORTRICINA IN THE NATIONAL COLLECTION.

By RICHARD SOUTH.

CNEPHASIA SINUANA, Steph., and *C. INCANANA*, Steph.

For nearly a quarter of a century I have been under the impression that I knew *C. sinuana*, Steph., but it was not until quite recently that I became aware of the existence of *C. incanana*. The revelation came about when examining the Tortricina in the Stephens collection in the Natural History Museum. In working through the species of *Cnephasia*, I found three specimens over the name *sinuana*; each of these had one of the small oval labels on the pins which distinguish veritable Stephensian specimens from others which have been added since the collection went into the Museum. One of these specimens accurately

agrees with the description of *C. sinuana* (Ill. iv. 128); the other two were indicated as *cinerana*, Bent., a label bearing that name being pinned in the drawer under the specimens. These last are most certainly referable to *C. chrysanthæana*, Dup., but the type of *sinuana*, if it is not an aberrant form of *C. chrysanthæana*, is most distinctly not the *sinuana* of Wilkinson and all later authors. In the same drawer was a series of a *Cnephasia* over the name *incanana*, Steph. ("The Scotch Gray T."). The description of this species was found in the appendix to Stephens's 'Catalogue of British Micro-Lepidoptera,'* p. 101. The species is also included as *Cnephasia incanana*, Steph. MSS., in the list itself (p. 66, No. 12). There were twelve examples of this species in the series, but only three of these were Stephensian, and, although neither was so indicated, it was not difficult to fix on the type.

After a close but unsuccessful search through all the available literature to discover further reference to *C. incanana*, I communicated with Mr. Eustace Banks on the subject, but he was unable to refer me to any work wherein the species was mentioned. When he was in town lately, Mr. Banks was good enough to call at the Museum, and, when he had made a critical examination of the types of *sinuana* and *incanana*, he expressed himself satisfied that the latter was identical with the insect that he and others have always considered to be *sinuana*, Steph. With regard to the specimens standing as *sinuana*, he concurred in the removal of the two labelled *cinerana*, Bent., to *C. chrysanthæana*; but he was rather dubious, I think, about referring the type of *sinuana* to that species also.

I append a copy of the original description of *C. incanana* :—

"*Alis anticis cinereo-albidis, fascia basali rotundata, secunda obliqua media, margineque postico nigro-fuscis.* (Exp. alar. 7-8 lin.)

"Head hoary; thorax and anterior wings pale ashy-white, or hoary, with a few dusky scales; near the base is a distinct deep fuscous bar, rounded externally, and not reaching to the inner margin; on the costa towards the middle is a similarly coloured bar, extending across the wing, but not to the anal angle; this bar is well-defined and bi-angulated on the basal edge, but on the hinder one it is gradually shaded off to the ground colour; the hinder margin is also fuscous, with a curved black transverse streak, reaching from the costa to nearly the anal angle; fringe ashy; posterior wings and fringe pale fuscous.

"Scotland: Perthshire."

It will be noted from the above that the subbasal bar is described as rounded externally, whereas of *sinuana* the description runs: "with an incurved deep fuscous *fascia* near the base, having a *tooth without*." The italics are mine. Wood's fig. 1003

* 'List of the Specimens of British Animals in the Collection of the British Museum,' part x. Lepidoptera (continued). 1852.

(*obsoletana* in error) represents *sinuana*, Steph., whilst Wilkinson's figure of *sinuana* (Brit. Tort. pl. ii. fig. 6) is really that of *incanana*, Steph.

CATOPTRIA RUFANA, Steph., and C. EXPALLIDANA, Haw.

In the Stephens collection were five specimens of a *Catoptria* over the name *expallidana*, and in the same series a specimen with the name *rufana* pinned under it. The latter, except in the matter of colour, does not agree exactly with Stephens's description of "*Carpocapsa*" *rufana* (Ill. iv. 124), as there are no traces of the "very obscure somewhat ocellated silvery spot, with two fulvescent lines in the middle." Wood's fig. 989 certainly represents this particular specimen. Of the other specimens referred to, two only are Stephensian, and neither of these can be made to accord with Stephens's description (identical with Haworth's) of *Bactra expallidana*, Haw., but they fit in very closely with the *C. expallidana* of Wilkinson, Stainton, and others, and in part with Stephens's description of *rufana*.

As pointed out to me by Mr. Banks when he examined the series, the specimen of *rufana* might be a reddish form of *B. lanceolana*, Hüb., and there is a somewhat similar example from Stainton's collection in the Museum series of this species. I am, however, not at all certain that the Stephens specimen is referable to *B. lanceolana*. In his Catalogue, previously mentioned, Stephens places *rufana* under "*Grapholita*" *expallidana*, Haw., as a synonym, and he quotes Wood's fig. 989. Now, as I have already stated, the specimen of *rufana* in Stephens's collection is without doubt the one figured by Wood, although it does not tally in every detail with Stephens's description. It would appear therefore that this description was made from more than one individual. The fact of specimens with a lined ocellus (the *expallidana* of Wilk. and Sta.) being in his series with *rufana* strongly supports this view. But why did he afterwards merge *rufana* in *expallidana*, Haw.? Seeing that there is no mention of an ocellus in the description of *expallidana*, Haw. and Steph., it would seem that both authors had a species before them which was not identical with the *expallidana* of Wilkinson and others, and in part with the *rufana* of Stephens. The description of *expallidana*, Haw., in Ill. iv. 125, reads: "*Pallida, lucida, tincturae castaneae versus alarum anticarum icterici*"; and to this Stephens adds: "Palpi long, and slightly curved over the back." He further remarks: "Taken near Coombe Wood: probably not actually belonging to the genus [*Bactra*], but my specimen is too injured to determine." I have been unable to detect any specimen in the Stephensian collection that could be the one from which the above was written.

NEW CULICIDÆ FROM THE WEST COAST OF AFRICA.

BY FRED. V. THEOBALD, M.A.

THE new Culicidæ described here were sent me by Mr. Austen, of the British Museum, and were collected at Bihé, Angola, Portuguese West Africa, by Dr. Creighton Wellman in 1904, and at Sierra Leone by Major Smith, D.S.O., R.A.M.C.

The new *Danielsia* and *Edimorphus* are very marked and beautiful species. The *Pyretophorus* was pointed out as being distinct from *P. costalis*, Loew, by Mr. Austen, after whom I have named the species. The *Anopheles* closely resembles *A. nigripes*, Staeger, but is clearly distinct.

The types are deposited in the National Collection. The strange genus *Heptaphlebomyia* is more fully described than in my Monograph, as fresh material was included in the collection from Angola.

Genus ANOPHELES, Meigen.

(Syst. Besch. 1818, Meigen; Mono. Culicid. iii. p. 17, Theobald.)

ANOPHELES SMITHII, n. sp.

Head black, with a patch of frosty grey scales in front; proboscis black; palpi black, with three narrow pale bands, apex black. Antennæ with outstanding scales as well as hairs on the second segment, giving a tufted appearance. Thorax frosty grey in the middle, deep brown at the sides, and with a median dark line and brown hair-like scales. Abdomen black, with dull golden hairs. Legs black, unbanded. Wings unspotted, the veins clothed with dense dark brown scales.

♀. Head black, with a patch of frosty grey upright forked scales in front, dense black upright forked scales behind, over which shows a prominent tuft of large grey narrow-curved scales projecting forwards from the thorax; several thick black bristles project forwards between the eyes; proboscis and clypeus black, the former thin; palpi as long as the proboscis, thin, scaly, black, with three pale bands, the apical segment black. Antennæ black, the second segment with a small dense tuft of hairs on the inner side as well as the normal longer black ones. Thorax frosty grey in the middle, showing a median dark line and a pale yellowish brown one on each side of it in front, more or less tessellated behind, and with many small black specks, the sides deep brown, the pale frosty area contracted in front, thus widening the dark brown lateral areas; hairs or hair-like scales of thorax brown; scutellum and metanotum deep brown, posterior border-bristles of the former black. Abdomen black, with deep brown hairs. Legs long and thin, deep brown; ungues equal and simple, thin, rather long. Wings clothed with dense rather stumpy lanceolate scales, uniformly dark brown; the first submarginal cell considerably longer and narrower than the second posterior cell, its base nearer the base of the

wing than that of the latter, gradually becoming acute at the base, its stem about two-thirds the length of the cell; stem of the second posterior cell longer than the cell; supernumerary and mid cross-veins close together, the mid a little behind the supernumerary posterior cross-vein about its own length distant behind the mid. Length, 3.5 to 4 mm.

Habitat. Sierra Leone (800 ft.) (Major Smith).

Observations.—Described from several females collected by Major Smith. It is a very dark species, coming near *A. nigripes*, Staeger, but can be told at once by the denser wing-scales and banded palpi. The structure of the second antennal segment is very marked; the scales are rather long and outstanding, giving a tuft-like appearance.

Genus PYRETOPHORUS, Blanchard.

(Comp. Rend. Soc. d. Biol. p. 795 (1902); Mono. Culicid. iii. p. 66, 1902, Theobald.)

PYRETOPHORUS AUSTENII, n. sp.

Head black, with grey scales in front; proboscis black, with two broad snowy white bands, the last forming a white apex to the palpi, and a third very narrow white band. Thorax brown, clothed with silvery grey scales; also the scutellum. Abdomen black, with golden hairs. Legs black, with apical white tips. Wings with black and white patches of scales, costa with two small white spots and traces of a minute third spot towards the base; most of the veins pale-scaled, but prominent black spots at base of the second posterior cell and apex of lower branch of fifth long vein.

♂. Head black, with upright snowy white forked scales in front, black ones behind; proboscis black; palpi black-scaled, densely at the base, with two broad white bands towards the apex, one forming the apex of the palpi, and a third small one towards the basal half. Antennae black, with grey pubescence. Thorax black, with scattered broad curved snowy white scales; also the scutellum. Abdomen black, densely clothed with golden hairs; the two lobes with black scales. Legs black, the apices of all the segments, except the last in the fore and mid legs, with a narrow white band; in the hind legs all the segments are banded; unguis equal and simple, rather long. Wings with rather dense *Pyretophorus*-like scales; the costa with three white spots, the apical one large, the second smaller, and the third very small; all three spread fairly evenly on to the first long vein, which has in addition a small white spot between the two apical costal ones, and another near the third spot, its base mostly white. On the base of the costa is another small white spot not reaching the top of the costa; the branches of the third long vein are black at the tips and bases near the fork, and there is another black patch near its base; the third long vein pale, except for a black spot near the apex, and two near the base; the fifth has two black spots near the apices of its branches, a large black-scaled area in front of and including the base of the fork and its stem near the fork, rest of the vein pale-scaled; the sixth has three black spots, the median one the largest; wing-

fringe with a pale area at the junction of all the veins. First submarginal cell considerably longer and a little narrower than the second posterior cell, its base nearer the base of the wing, its stem about one-fourth the length of the cell; stem of the second posterior cell rather more than two-thirds the length of the cell; supernumerary cross-vein a little behind the mid, the posterior about its own length distant behind the mid; posterior border-scales of the fringe long, narrow, and curved. Length, 5 mm.

Habitat. Bihé, Angola (Dr. Creighton Wellman).

Observations.—Described from a single perfect female. The chief characters are in the thoracic squamose structures and marked wing ornamentation.

Genus DANIELSIA, Theobald.

(The 'Entomologist,' p. 78, March, 1904.)

DANIELSIA WELLMANII, n. sp.

Head creamy white, with two median black spots. Palpi and proboscis brown. Thorax deep brown, with a broad creamy area on each side, expanding in front, and passing around the front of the mesonotum, and with a short creamy median line arising from the pale anterior area; numerous golden brown bristles posteriorly. Abdomen black, with basal white lateral spots on basal segments, becoming median on the apical ones. Legs deep brown, front pair unbanded, mid and hind with a broad basal pale band to the metatarsi and first tarsal segments.

♀. Head deep brown, with rather loosely applied flat creamy scales, with two large patches of flat dark scales above, and with creamy narrow-curved scales behind. Clypeus and proboscis black; palpi rather long, black; antennæ black, with indistinct narrow grey bands. Thorax black, clothed with narrow-curved bronzy-brown scales, with a broad creamy scaled area on each side, which expands anteriorly, and which meets around the front, and sends a narrow short median line of creamy scales into the brown area; a few pale scales in front of the scutellum and numerous golden brown bristles over the roots of the wings; prothoracic lobes with small flat creamy scales; scutellum with rather broad narrow-curved scales, narrowest on the lateral lobes; border-bristles bright golden brown; mesonotum black; pleuræ with white puncta. Abdomen black, with deep violet reflections; the basal segments with basal white lateral spots, which become median on the last two or three segments, the latter having a few white scales extending on to the dorsum and in the middle, but not forming bands; border-bristles small, pale golden. Venter with basal white bands. Legs deep blackish brown, the front pair with only a faint trace of a pale band at the base of the metatarsus; the mid and hind with a broad white basal band to the metatarsi and first tarsus; venter of base of fore and mid femora white; base of hind femora white, and white knee-spot. Ungues uniserrated, the tooth long. Wings with the first submarginal longer and narrower than the second posterior cell, its stem nearly two-thirds the length of the cell; stem of the second posterior as long as the cell; posterior cross-

antennae twice its own length distant from the mid; lateral vein long and straight. Halteres creamy. Length, 4.0 mm.

Locality. Bihe, Angola.

Observations.—Described from a perfect female. It is a very distinct species, easily told by the thoracic and abdominal ornamentation and leg-banding. It clearly comes in the genus *Microgaster*, but the scutellar scales are rather broader than in the type *D. sublineata*).

(To be continued.)

PREOCCUPIED NAMES IN COLEOPTERA.

By T. D. A. COCKERELL.

There is urgent need for someone to go over the generic names used for Coleoptera, and sift out the homonyms. For some reason entomologists seem extraordinarily careless about homonymy, and it is evident that some of them, while proposing numerous new generic names, never take the trouble to consult the indices of Scudder or Waterhouse. *Alexia*, Steph., 1835, is the name still in use for a genus of Endomychidæ, but it is much earlier of the molluscan *Alexia*, Leach, 1818.* Fairly recent still was the name *Anodon*, proposed in the seventies, for a *Dynastine* beetle, but Oken used *Anodon* in Mollusca in 1815. The *Dynastine* genus may take the name *Paranodon*, n. n. (Cresson, Cat., 1862, for an Endomychid genus, would be considered by many a homonym of *Corypha* (Gray, 1840; Walker, 1851), but I think it may be allowed to stand.† Weise, in 1902, proposed *Nemata* and *Spilonota* as the names of two Chrysomelid genera, but both names are invalid (Gray, 1870; Stephens, in *Entomologist*). *Nemata* may be changed to *Stenellina*, n. n., type *Nemata marginata* (Weise), and *Spilonota* may become *Spilonotella*, n. n., type *Spilonotella sagax* (*Spilonota sagax*, Weise). The original descriptions are in Arch. Naturg. vol. 68, pp. 101 and 131. In the same paper, Weise proposes a genus *Sphondyla*, which many would consider too like *Sphondyla* (Illig., 1795).

While writing the above I have found that, according to Mr. B. B. Smith (Ann. Entomol. Soc. 1903, p. 361), the date given for the molluscan *Alexia* in the 'Numerical Zoologist' is wrong; that is, it is the date of the *Numerical Zoologist*, which was not actually published until 1847. Hence the date of the molluscan *Alexia* stands, and it is the familiar molluscan *Alexia* which is the homonym of *Corypha*, Gistel, 1848.

NEW SPECIES OF HYMENOPTERA (ACULEATA, ICH-
NEUMONIDÆ, AND BRACONIDÆ) FROM INDIA.

By P. CAMERON.

(Concluded from p. 86.)

SPILICHNEUMON COXALIS, sp. nov.

Niger; facie, clypeo, mandibulis, linea pronoti, mesosterno, scutelloque flavis; abdominis medio late rufo; apice petioli flava: pedibus rufis, coxis posticis, apice tibiæ posticarum tarsisque posticis nigris. ♂. Long. 10 mm.

Hab. Simla (Nurse).

Antennæ black; the under side of the scape yellow, of the flagellum brownish; they are hardly longer than the body, and taper perceptibly towards the apex, where they are serrate. Head black; the face, clypeus, mandibles, the inner orbits to the occiput narrowly, and the outer from near the top broadly, yellow. Face and clypeus closely, uniformly, and distinctly punctured; the front and vertex are more closely punctured. Mandibles yellow, their teeth black, the part behind them rufous; palpi pale yellow. Thorax black, shining; the edge of the pronotum, the scutellum, the apex of the post-scutellum, the tegulæ, and the tubercles pale yellow. Mesonotum closely and uniformly punctured, the scutellum flat and less closely punctured. Post-scutellum smooth; its sides at the base largely depressed. Median segment closely and distinctly punctured, the base and the areola smooth and shining; the apical slope is thickly covered with white hair; the areola is twice longer than wide; the basal keel is flat, wide, and broken in the middle; the apex is transverse; the inner side is bordered by a wide furrow; in the centre of the apex is a small triangular projection; the surface is finely shagreened. Pleuræ closely punctured; the apex of the pro- irregularly striated. Wings clear hyaline, the stigma and nervures black. The four anterior legs are reddish fulvous; the coxæ and trochanters pale yellow, the hinder coxæ black, their apex yellow all round, the basal joint of the trochanters black, as is also the apex of the hinder femora narrowly, the apical two-thirds of the tibiæ, and the tarsi entirely; the calcaria pale yellow. Petiole black; the apex with a yellow band, which is narrowed in the middle; the second, third, and basal half of the fourth segment rufous; the rufous band on the fourth extends to the apex; there is a narrow yellow band on the apex of the fifth, a large one on the apex of the sixth, and the seventh segment is entirely yellow. The segments and the post-petiole are thickly covered with short white pubescence, and closely punctured; the gastrocelli are small, deep, and smooth.

CRATICHNEUMON ERYTHROZONUS, sp. nov.

Niger; abdomine late femoribusque posticis rufis; alis hyalinis, nervis stigmatæque nigris. ♂. Long. 11 mm.

Hab. Simla (Nurse).

Antennæ as long as the body; the flagellum brownish beneath.

Head black, the inner orbits from the middle to shortly below the eyes lemon-yellow, the band becoming wider below; the face and clypeus, except at the apex, closely and rather strongly punctured, and thickly covered with white pubescence; the apex of the clypeus is slightly obliquely depressed and impunctate; the front and vertex are closely and distinctly punctured. Mandibles black, dark rufous near the apex; the palpi fuscous. Thorax entirely black, and thickly covered with short white pubescence; the scutellum is less closely punctured; the basal half of the post-scutellum is smooth, the apical closely punctured. The base of the median segment is closely and somewhat strongly punctured; the sides of the area are irregularly striated. Pleurae uniformly and distinctly punctured. Mesosternum thickly covered with white pubescence. The four anterior tibiae in front and the anterior femora above in front are pale testaceous; the hinder femora, except at the apex, are bright red; the calcaria are black. Wings clear hyaline, the nervures and stigma black; the stigma fuscous on the lower side; the disco-cubital nervure is largely bullated in front of the stump of a nervure; the recurrent nervure bullated above and below the stump. Petiole closely punctured; the middle of the post-petiole smooth; the sides sparsely punctured; the other segments are closely punctured and thickly covered with short white pubescence; the gastrocoeli are shallow and stoutly striated at the base; the apex deep, wide, and aciculated.

ANOMALON APICATE, sp. nov.

Nigrum; abdomine rufo, apice nigro; facie, clypeo, scutello, post-scutelloque flavis; pedibus anterioribus flavis, posticis rufis; alis hyalinis, stigmatibus fusco, nervis nigris. ♂. Long. 16 mm.

Hab. Simla (Nurse).

Antennae testaceous, the second and the greater part of the fourth joints black. Head black, below the antennae pale yellow; the vertex closely punctured; the front with eight irregular keels on the central part, which is also closely transversely striated; the face closely and distinctly punctured, and thickly covered with white pubescence; the base of the clypeus closely punctured, the apex almost impunctate. Mandibles pallid yellow, their teeth black; the palpi pallid yellow. Thorax black; the scutellum, post-scutellum, and tegulae yellow. Mesonotum closely and rather strongly punctured, its centre at the base raised; the apex in the middle transversely irregularly striated. Scutellum and post-scutellum coarsely punctured. Propleurae above closely punctured; the rest coarsely irregularly reticulated. Mesopleurae above irregularly longitudinally striated; below closely punctured. The median segment at the base is closely rugosely irregularly reticulated; the lateral keels are roundly curved; the space behind these is smooth; the apex behind is narrowed into a distinct neck, and is irregularly transversely striated. Metapleurae coarsely irregularly reticulated. Legs rufous; the anterior pair paler, more yellowish in tint; the four front coxae and trochanters pale yellow. Wings hyaline, with a faint fulvous tinge at the base; the stigma testaceous, the nervures black. The second and third segments of the abdomen are black above; the apical two are entirely black.

BRACONIDÆ.

IPHIAULAX ELIZEUS, sp. nov.

Luteous; the antennæ, front, vertex, the occiput, the upper half of the outer orbits, and the apical abdominal segment black; the face, clypeus, and malar space, and upper half of the inner orbits, pale yellow; the wings to the transverse basal nervure and the basal half of the stigma yellow; beyond that dark fuscous; the apex of the hinder tibiæ broadly, and the hinder tarsi black. ♂ and ♀. Length 8, terebra 2 mm.

Hab. Deesa (Nurse).

Head smooth and shining, the face sparsely covered with pale hair; mandibles pale rufous. Back of abdomen irregularly rugosely punctured; the sutures on the second, third, and fourth segments are wide and stoutly striated; on the sides of the fifth the furrow is wide, closely and finely striated; the furrows on the apex of the fifth and sixth segments are narrow, distinct, and deep; there is no keel or distinct plate on the base of the second segment. The base of the first cubital cellule is hyaline, broadly above and below; the cloud on the posterior wings commences opposite that on the anterior.

IPHIAULAX SMENUS, sp. nov.

Rufous, the flagellum of the antennæ black; the wings dark fuscous, the first cubital cellule and a spot below it hyaline, the stigma yellowish fulvous; the mesonotum and scutellum sparsely but distinctly punctured; the median segment closely and strongly punctured. ♂ and ♀. Length 8-11 mm., ovipositor 13-16 mm.

Hab. Deesa (Nurse).

Vertex smooth; the front with a deep furrow, its sides finely and closely punctured; the sides of the face somewhat strongly and closely punctured. Clypeus almost smooth, except close to the apex. Mandibles punctured and rufous at the base, the apex black. Parapsidal furrows distinct, narrow, deep, indistinctly crenulated. Median segment thickly covered with white pubescence. Petiole coarsely rugosely punctured, except in the centre at the apex; the lateral furrows with a few transverse keels; the second, third, and fourth segments are more closely rugosely punctured; the transverse and oblique furrows are closely striated; the apices of the segments are smooth; the oblique furrows on the second segment are stoutly striated, the hollow at their apex smooth. There is no plate or keel on the base of the second segment. The basal four segments of the abdomen are together as long as the head and thorax united.

Agrees in coloration (except that the hinder tibiæ and tarsi are not black) with *I. punjabenses*, Cam., but that species has the ovipositor only as long as the body, and the abdomen is shorter and broader. The species varies considerably in size. The male has (or may have) the apical segments of the abdomen black.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

(Continued from p. 90.)

HEPIALIDÆ.

Hepialus humuli.—Abundant near Halton, County Asylum grounds, Quernmore, Grimshaw Lane, &c., in July.

H. sylvanus.—Fairly common at Arnside and Witherslack in July.

H. fusconebulosa (velleda).—Plentiful in Grimshaw Lane, Ridge Lane, Blea Tarn, Halton, &c., late June and July. The var. *carnus* is fairly common.

H. lupulinus.—Abundant in Grimshaw Lane, near Halton, County Asylum grounds, &c., in June.

H. hectus.—Very local near Quernmore in late June.

LYMANTRIADÆ.

Porthesia similis.—Common in July everywhere, especially at Blea Tarn and near Freeman's Wood.

Dasychira pudibunda.—Local; near Clougha. I beat the larvæ from oak in this locality in 1902, and bred the imago the following June. "Uncommon near Quernmore" (G. Loxham).

Orgyia antiqua.—Common on Cockerham Moss, about Arnside and Witherslack, &c., in August.

LASIOCAMPIDÆ.

Pæcilocampa populi.—Fairly common some seasons, scarce in others; comes freely to the street lamps about Lancaster in October and November.

Eriogaster lanestris.—Nests of the larvæ are plentiful at Grange, Warton, &c., in late June.

Macrothylacia (Bombyx) rubi.—The larvæ are common about Witherslack, Methop, and Grange in August. In the wild state the imago is uncommon.

Lasiocampa (B.) quercus.—Plentiful at Witherslack, less so at Heysham, in mid-July. Var. *callunæ* occurs about Clougha and near Quernmore,

Cosmotriche (Odonestis) potatoria.—The larvæ are often abundant about Heysham in the spring; the imago occurs in July.

SATURNIADÆ.

Saturnia pavonia.—Abundant on the mosses around Witherslack and Methop; less plentiful near Quernmore in late April and May.

DREPANIDÆ.

Drepana lacertinaria.—Fairly common at Methop and Witherslack in June. I have bred this species from larvæ obtained in September near Methop bank.

D. falcataria.—Fairly common at Methop and Witherslack in late May and June.

Cilia glaucata.—Common in Grimshaw Lane, at Blea Tarn, &c., in June.

NOTODONTIDÆ.

Cerura (Diceranura) furcula.—I have bred this species from Witherslack and Methop larvæ obtained in September. The imago occurs in June, on sallow tree-trunks, but is not common.

C. (D.) bifida.—Scarce. I have bred this species from Methop larvæ only, taken from aspen trees in September. "I have taken the larvæ on aspen trees near Faraway Moss, Witherslack, occasionally" (G. Loxham).

Diceranura vinula.—Fairly common and generally distributed in June.

Pterostoma palpina.—Uncommon. I have bred this species from larvæ beaten from sallow and birch near Methop bank in September.

Lophopteryx camelina.—Occasionally in the County Asylum grounds in July. The larvæ are common on birch and oak on the mosses at Cockerham, Methop, and Witherslack in September.

Pheosia (Notodonta) dictæa.—Local, and not common. I have only bred this species from Witherslack larvæ, beaten in September from sallow.

Notodonta dromedarius.—Not uncommon on the Witherslack, Methop and Cockerham Mosses. The larvæ occurs on birch in September.

Phalera bucephala.—Common everywhere in June. The larvæ occur in Grimshaw Lane, Ridge Lane, near Halton, &c., on oak, in July and August.

Pygæa curta.—Not common. I have bred this species from larvæ taken near Methop Bank in September. The imago appears in late April and May.

CYMATOPHORIDÆ.

Habrosyne (Thyatira) derasa.—Fairly common at sugar near Bowerham Bottom, County Asylum grounds, Witherslack, Methop, &c., in July.

Thyatira batis.—Fairly common at sugar in late June. County Asylum grounds, Bowerham Bottom, Witherslack, &c.

Cymatophora duplaris.—Local. I have bred this species from Methop and Witherslack larvæ beaten off birch in early September. The imago appears in May and June.

NOCTUIDÆ.

Bryophila perla.—Common and well distributed on walls, July and August.

Demas coryli.—Comes to sugar at Arnside and Grange in May and June.

Acronycta psi.—Fairly plentiful and generally distributed in June and July.

A. leporina.—Local. I have only bred this species from larvæ taken off birch trees in the County Asylum grounds (Old Side) in July and August. The imago appears in late May and June.

A. megacephala.—I brought a quantity of larvæ from London last year (1902), and have since found larvæ feeding on poplar in the County Asylum grounds. I have also bred it from larvæ taken in September near Methop bank, otherwise I should not have included it in this list.

A. rumicis.—Fairly common and generally distributed in late May and June. The larvæ are generally to be found in dyke sides, &c., on rumex and various other low plants in August and September.

A. menyanthidis.—Occurs near Methop, Clougha, &c., but is not common, in June.

Craniophora (A.) ligustri.—Uncommon. I took three specimens in mid-July in the County Asylum grounds. "I have taken it in Corporation Wood, Quernmore" (G. Loxham).

Diloba caruleocephala.—Fairly common and generally distributed. The imago in September and October, and the larva on the white-thorn in June; Quernmore, Halton, Caton, Grimshaw Lane, and near Clougha.

Leucania lithargyria.—Fairly common at sugar, County Asylum grounds, near Halton, Grimshaw Lane, &c., in June and early July.

L. comma.—Common at sugar and bloom; generally distributed in June.

L. impura.—Abundant at sugar in July.

L. pallens.—Abundant everywhere at sugar in July and August.

(To be continued.)

NOTES AND OBSERVATIONS.

My attention has been called to a note on the type of the Linnean genus *Cimex* by Mr. Kirkaldy in the last number of the 'Entomologist.' I dealt with the matter in 'Nature' of March 17th, 1904, and showed why *C. lectularius* must be regarded as the type of the Linnean genus, and I also pointed out that *Clinocoris* is a mere synonym of *Acanthia*. To this note I would ask the attention of anyone who takes any further interest in the matter. If Mr. Kirkaldy would consult the 12th edition of Linnæus he would find why *C. lectularius* is classed with winged species under *Cimex*.—W. T. BLANFORD.

BREEDING DRAGONFLIES FROM THE EGG.—In my note (Entom. xxxvii. 285) recording dimorphism in the females of *Ischnura elegans* and *Enallagma cyathigerum* at Wicken, I mentioned that I had attempted to get the females taken in copula to lay eggs, but without success. I now find, however, that in one of the aquaria used in the attempt with *E. cyathigerum* there are a number of dragonfly nymphs about half an inch in length. Before being used for the dragonflies the aquarium had been untouched for more than a year, and contained only small Crustacea, &c.; so that there can be no possibility of accidental introduction of the nymphs. The dragonflies taken in copula were put in a large muslin bag over the aquarium, and I saw the females feeling about under the water with the tip of the abdomen, and occasionally walking down the weeds till they were quite submerged, but at the time I could find no eggs. I should be grateful if anyone experienced in rearing dragonfly nymphs could tell me what is the best food to supply them with when they grow larger. And I should like again to point out that anyone interested in dragonflies who may succeed in

rearing considerable numbers from *known parents*, of a species shewing female dimorphism, will be able to render valuable service to science.—L. DONCASTER; University Museum of Zoology, Cambridge, Feb. 13th.

[If such small animals as water-fleas can be easily obtained, these should be given. Otherwise decaying leaves, &c., from the bottom of a pond or stream will always contain bloodworms and other small life on which the nymphs will feed; but care must be taken that no fresh nymphs are introduced. The size of the nymphs of *E. cyathigerum* in the present instance raises an interesting question. Clearly they will not be full-grown and ready to emerge in May, yet they will probably disclose imagines this year. It is pretty certain that in this species emergences do take place late in the season; still there do not appear to be two broods annually. Possibly the eggs laid early in the season produce early imagines in the next season, while the late ones produce late imagines the next year. Are there two races, in fact? Perhaps Mr. Doncaster will be able to settle the question. I have thought that the late males of *E. cyathigerum* at the Black Pond, in Surrey, have more pronounced markings than the early ones.—W. J. L.]

WESTERN SMERINTHIDS.—The whole Smerinthid fauna of the United States numbers only about nine species. A few of these have spread over a very large area, and have split up into more or less distinguishable local races. Thus *Smerinthus cerisyi*, Kirby, and *Pachysphinx modesta*, Harris, have their eastern and western forms, quite distinguishable, but not very well to be separated specifically. The beautiful *Calasymphorus excrucatus*, Abbot and Smith, is common in the States east of the plains, but has apparently not been reported further west.* At Pecos, New Mexico, July 22nd, 1903, I took a fine female of *C. excrucatus*, with an expanse of 85 mm. It differs from the normal eastern form in having the upper third of the outer margin of the anterior wings more strongly dentate, and the colours of the wing in general paler and yellower, with the upper two-thirds of the median field light greyish ochre, leaving the dark central spot very conspicuous. Provisionally, this form may be treated as a variety, *pecosensis*; but, as the pallid coloration is just what would be expected in a western race, judging from other known cases, it is at least probable that the discovery of other examples will enable us to recognize a subspecies or idiomorph. On the other hand, it is very likely that a similar coloration may occur here and there as an aberration among eastern examples.—T. D. A. COCKERELL; Boulder, Colorado, Feb. 10th, 1905.

LEUCOPHGEA SURINAMENSIS, L., BREEDING IN BRITAIN.—With reference to the interesting note by Mr. Horrell in your last issue (*ante*, p. 92), it may be worth recalling that at the October (1904) meeting of the Lancashire and Cheshire Entomological Society in Liverpool, I exhibited a series of this distinct little cockroach, in all stages of growth, which had been captured amongst turfs at Fallowfield during 1903 and 1904, and kindly sent to me by Dr. W. E. Hoyle, M.A., and Mr. J. Ray Hardy, of the Manchester Museum. Cockroaches are at

* Except in the far north-west (British Columbia), where climatic conditions are entirely different from those in New Mexico.

all times difficult to rear in captivity, and I regret that I was unable to keep the insects alive sufficiently long to learn much of their habits and life-history. I hope Mr. Horrell may be more fortunate.—E. J. B. Sopp; Liverpool Road, Birkdale, March 15th, 1905.

THE MASON COLLECTION.—A portion of this historical collection of British Lepidoptera, accumulated by the late Philip Brookes Mason, Esq., M.R.C.S., F.L.S., &c., of Burton-on-Trent, was dispersed at Stevens's Auction Rooms on March 14th and 15th last. Besides the extinct and rare species and numerous interesting aberrations that it contained, there were types and other specimens from the collection of Adrian Hardy Haworth, author of '*Lepidoptera Britannica*,' and editor of the first volume of '*Transactions of the Societas Entomologica*,' which was founded in London in the year 1806. Also some types and examples of many species from other collections that were formed in the early part of the last century.

The attendance was good, but perhaps not quite so numerous, especially on the second day, as we have seen on other occasions when notable collections have come under the hammer. The bidding for many of the lots could hardly be described as competitive; in fact, it was sometimes found necessary to combine two and even three lots before any desire to make an offer was evinced. The majority of the specimens were on white pins, and without localities, &c.; possibly, in these days of black pins and full data, this may have somewhat influenced prices. Altogether there were 538 lots put up during the two days, and we believe that the amount realized was somewhere about £550. In the following notes only the most important details of the first day's sale are referred to:—

BUTTERFLIES.—*Pieris daphidice*, eleven specimens, averaged 11/- each. The specimen mentioned in Newman's '*British Butterflies*' as having been reared from one of the eggs laid by a female captured near Dover was sold for 16/-; a pair, one of which was a female captured in the Isle of Wight in 1867, 30/-; one example taken at Folkestone, and another without data, 26/-; three specimens (two from Sydenham), 27/6. There were sixteen examples of *Colias edusa* var. *helice*; these averaged 2/6 apiece, and seemed to be not dear at the price. A specimen of *Argynnis niobe* (Canterbury), together with a long series each of *A. euphrosyne* and *A. selene*, only made 8/-. Of *A. latonia* there were no less than sixteen specimens, and these sold for four guineas, or at the rate of 5/3 each. They were in four lots of three specimens, and one lot of four specimens, the price per lot ranging from 14/- to 24/-. Ten examples of *Vanessa antiopa* produced £9 8s. altogether. They were put up singly, and the prices each were 26/- (3), 22/- (1), 18/- (2), 16/- (1), 14/- (2), and 8/- (1). Several of these were ancient examples from the Haworth and E. Shepherd collections, but those that brought the highest price were two from Horning, Norfolk (1872), and one taken by the late Mr. J. Sang at Darlington. An example of *Anosia* (*Danaïs*) *plexippus*, L. (*archippus*, Fabr., *erippus*, Cr.), the common milk-weed butterfly of the United States. Apparently this species had not been noted as migratory previous to 1870. However this may be, its first visit to Britain seems to have been in 1876, and between that year and 1896 several specimens have been recorded, chiefly from

places on the southern and western coasts of England, and during the years 1885-6. The earliest report was from Wales, and the latest records (of specimens seen) were from Surrey and Hampshire. The Mason specimen was formerly in the late Mr. Tugwell's collection, and at the sale thereof realized 35/- It now passes into the Tring Museum at the enhanced price of £4 10s. *Lycæna arion*, in good condition, were not expensive. Three lots of males, seven and eight in a lot, sold at 7/- a time, while a series of seven females found a buyer at 12/-, and six other females (one with large spots) went for 20/-. The three dozen brought in a total of 53/-, and this gives an average of about 1/6 each all round, or, say, 10/- per dozen males, and 30/- per dozen females. For three couples of *L. semiargus* (*acis*), the prices were 45/-, 60/-, and 70/-; two lots of the same species, each comprising three males, 40/- and 50/-; three males, 35/-; three males and two females, with long series of *L. minima*, 60/-; three males, with a number of *L. minima*, some of the latter without spots on the under side, 32/6. Sixteen specimens of *Chrysophanus dispar* increased the total for the first day's sale by £80 6s., which amount gives an average of about £5 per specimen. The highest price was £8 for a fine female in which the basal spots of the fore wings were united. The lowest bid was 45/- for a female example that was not exactly in the best condition. Two examples of *C. virgaurea* and one of *C. chryseis*, from Haworth's collection, together with nice series of *Thecla w-album* and *T. pruni* (among the latter was one example without white lines on under side), went for £3 10s. (Janson). These two "coppers" are not now recognized as British species, but the specimens offered are of historical interest.

MOTHS.—A dark specimen of *Acherontia* (*Manduca*) *atropos*, with broad black outer margin, sold for two guineas, and an example of *Hyloicus* (*Sphinx*) *pinastri* from Haworth's collection, together with a specimen of the same species from E. Shepherd's collection, only made 12/-, whilst 18/- was given for another specimen that formerly belonged to Dr. Hewgill. Eight *Deilephila euphorbiæ* obtained £8 12s. One specimen labelled from "Mr. Raddon, Sept., 1848; larva found near Bideford," ran the bidding up to 40/-; three other Raddon specimens sold for 16/-, 18/-, and 22/- each; the specimen recorded by the late Mr. W. P. Weston as taken by himself in a garden at Southampton in August, 1871, made 24/-; one from Mr. Spry's collection brought in 36/-; and one from Haworth's collection, coupled with *D. hippophaës* (Devonshire) only fetched 12/-. A specimen of *Daphnis nerii*, taken in a street at Burton-on-Trent in 1888, found a purchaser at 14/-; another example from Dr. Hewgill, together with the type of *Phlegethontius quinque-maculata*, Haw., a North American species, was bought for the Tring Museum at a cost of £6. *Deilephila galii*, of which species there were twelve specimens, went for 2/6 apiece, while the seven *D. livornica* ranged in price from 7/- to one guinea. Of *Charo-campa celerio* nine specimens were offered, and these sold at from 8/- to 20/- each, the total for the set being £5 14s. Among the Sesiadæ were some very desirable species, and for the possession of some of these bidding was pretty brisk. Six examples of "*vespiformis*" were disposed of at from 12/- to 20/- each. *Sesia scoliiformis* and *S. sphegi-*

formis were put up in three assorted lots, thirteen or fourteen specimens in each, and fetched 14/-, 24/-, and 26/- per lot. Five specimens of *S. andreniformis*, lotted singly, produced £8 3s. altogether, but the price per lot varied greatly; one from E. Shepherd's collection only made 8/-; one from "Rev. A. Matthews" secured £4; two others went for 10/- each; and for one taken at Folkestone in 1878, 55/- was obtained. There was a nice series of *Zygana exulans*, but the price per specimen did not much exceed 1/-. Twenty-six *Z. filipendulæ*, including two examples of the yellow form and other minor aberrations, sold for 20/-. For a fine specimen of the rare "black" form of this species, known as *chrysanthemi*, the bidding quickly ran up to ten guineas (Janson). The type of *Sarothrips revayana* var. *stonanus*, Curtis, was sold for 27/6 (Janson), and the type *ramulanus*, Curtis, a form of the same species, made 20/-.

ABERRATIONS.—A curious specimen of *Euchloë cardamines*, in which the orange patch on left fore wing did not extend to the apex, was bought by Mr. Sydney Webb for 30/-. Two females streaked with orange on upper or under surface were sold for 18/- and 20/- respectively, one going into the collection of Mr. J. A. Clark. A straw-coloured variety of *Argynnis selene* sold for 20/- (Janson), but another interesting under-side aberration of the same species was obtained by Mr. Farn for 4/- less. There were two fine "sports" of *A. euphrosyne*; one of these, nearly black both above and below, was sold to Mr. Farn for 37/6; the other, "extraordinary light var., almost spotless, with cream-coloured margins," reached the handsome price of £8 (Tring Museum). A pale straw-coloured var. of *A. paphia*, from E. Shepherd's collection, sold for £2 (Janson), and a very dark, almost black, form of *A. aglaia* went for 20/-. Two aberrations of *Satyrus semele*, one tawny and the other very pale, were not dear at 22/-. A specimen of *Epinephele ianira* (*jurtina*) "cream coloured, with disc of fore wings orange, J. W. Douglas collection," realized £5 (Janson), and an interesting example of *R. tithonus*, "outer disc of fore wings white with pale grey border," was secured, we believe by Mr. Studd, for £4. An almost unicolorous male example of *Nemeobius lucina*, brownish orange or fulvous in colour, went for £3, but a similar aberration of the female was bought for the Tring Museum at £9. A specimen of the *schmidtii* form of *Chrysophanus phlaas* went for the easy price of 8/-. Although it was not exactly true *schmidtii*, it was only removed therefrom by reason of the slight creamy tint of the ground colour. The specimen was from E. Shepherd's collection. Among the species of *Lycana* there were some nice aberrations, but the prices obtained for them seemed to be low in most cases, possibly due to the absence of data.

The gynandrous specimens were five in number, and these realized £4 18s.:—(1) *Lycana ægon* (left ♂, right ♀), 28/-; (2) *L. icarus* (left ♂, right ♀), 18/-; (3) *L. icarus* (left ♀, right ♂), 16/-; (4) *Smerinthus populi* (left ♂, right ♀), 18/-; (5) *S. populi* (left ♀, right ♂), 18/-. Three hybrid *S. ocellata-populi* produced only 16/-.

Notes on the second day's sale will be given in the May number of the 'Entomologist.'

CAPTURES AND FIELD REPORTS.

TORTRICES IN THE LIVERPOOL DISTRICT.—The localities worked comprise Wallasey sand-hills, and Kirby and Simonswood Mosses, near to Liverpool; also Delamere Forest, some twenty miles away, in Cheshire. Most of the species are common and pretty generally distributed, but, as no local notes appear to have been published for some time, this record may be of interest. *Tortrix podana*, Scop., is common all round Liverpool. *T. rosana*, L., occurred freely at Wallasey, a nice series being bred from larvæ taken on willow early in July; while *T. dumetana*, Tr., was captured on Kirby Moss at the end of the month. *T. ribeana*, Hb., was taken sparingly on the Moss early in August, and a few *T. corylana*, Fb., were bred from Wallasey. *T. unifasciana*, Dup., occurred freely on palings around Sefton Park, though worn, as a rule, when I came across them. *T. viridana*, L. I did not see any green specimens, although very abundant on the Mosses, and at Delamere in July. The moths were yellow, although many appeared fresh; I attribute this to the damp, especially on the Mosses, where it was very noticeable. *T. ministrana*, L., and var. *ferrugana* occurred in some numbers at Delamere in May. *T. forsterana*, Fb., is common throughout the district, as one would expect of so universally distributed an insect. The genus *Peronea*, Curt., is well represented. *P. sponosa*, Fb., was bred from beech, and the moth was common on palings under the trees during September. The specimens are all noticeably darker than a series taken at Brockley, S.E., in 1898. A visit to Wallasey the last week in July produced *P. variegana*, Schiff., which was very abundant among the burnet-rose (*Rosa spinosissima*). The special object of search was *P. permutana*, of which only one example was found; another trip on August Bank Holiday was blank as regards this local insect, but *P. aspersana* turned up in good numbers. It is noteworthy that the black form of *variegana* was only found on the east side of Liverpool, in the Sefton Park district; the nearest approach to it, at Wallasey, was a nearly unicolorous dark brownish variety. *Teras contaminana*, Hb., was a common moth round Sefton Park in the autumn, but I did not take many, being busy with other things. The pretty *Dictyopteryx bergmanniana*, L., was plentiful among the burnet-rose on the sand-hills throughout June; one specimen was a pale lemon-yellow, with the ferruginous markings obsolete. *Penthina betulæana*, Haw., and *P. corticana*, Hb., are everywhere abundant among birch; some examples were bred from Delamere larvæ obtained in May. Of *P. sororculana*, Zett., only one was captured at Delamere, also in May. *Pardia tripunctana*, Hb., and *Spilonota incarnatana*, Hb., were met with at Wallasey, where the latter simply swarmed the last week in July, but only seemed to last a few days in good condition. *Aspis udmanniana*, L., is common, and found throughout the district. *Sericoris urticana*, Hb., *S. lacunana*, Dup., and *S. cespitana*, Hb., were also generally common. Delamere produced *Phoxopteryx myrtillana*, Tr., in May; abundant and easily disturbed in the daytime. *Hypermercia cruciana*, L., a pretty little species addicted to willow, abounded on the sand-hills, and, at Wallasey, was found to vary scarcely at all. *Grapholitha ramella*, L., and *Catoptria æmulana*,

Schl., were represented only by single specimens from Simonswood and Wallasey respectively. A visit to the Mosses at the end of July produced *Pedisca bilunana*, Haw., *P. occultana*, Doug., and *Retinia pinicola*, Hb., as well as one *R. pinivorana*, Zell., *occultana* being very common among the pines. *Pedisca solandriana*, L., was bred from birch at Delamere, and *P. semifuscana*, St., was yielded by larvæ found on sallow from St. Helens; these two variable species will have more attention in 1905, as they appear to be common in the district. *Ephippiphora similana*, Hb., and *E. pflugiana*, Haw., are represented by a few specimens of each. One specimen of *Dichrorampha petiverella*, L., was found at Wallasey; at the same place, in June, *Eupacilia dubitana*, Hb., occurred freely on the wing in the evening, and *E. angustana*, Hb., abounded on Kirby Moss among heather. I looked out keenly for evidences of melanochoic tendency, but so far as I could see there was no particular variation, the series I took being very little darker than some captured in Kent several years ago. I have one insect which has been doubtfully referred to *Pedisca corticana*, Hb., from Wallasey, and a few specimens of *Phloxodes tetraquetra*, Haw., from Delamere Forest; while, in conclusion, I should state that the following species were observed in some numbers, viz. *Sphaleroptera ictericana*, Haw., at Wallasey; *Catoptria ulicetana*, Haw., at Formby, on the sand-hills among furze; and *Tortricodes hyemana*, Hb., at Delamere in April.—WILLIAM MANSERIDGE; 27, Elmbank Road, Liverpool.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — March 1st, 1905.—Mr. F. Merrifield, President, in the chair.—The Duke of Bedford, K.G., President of the Zoological Society, &c., of Woburn Abbey, Beds., and 15, Belgrave Square, S.W.; M. Lucien Chopard, Membre de la Société Entomologique de France, of 98, Boulevard St. Germain, Paris; Mr. Wilfred Fleet, F.H.A.S., of "Imatra," Bournemouth; and Mr. Robert Sidney Mitford, C.B., of 85, Redcliffe Square, S.W., were elected Fellows of the Society.—Mr. H. St. J. Donisthorpe exhibited an example of *Oxyptoda sericea*, Heer, taken in Dulwich Wood, June 17th, 1904, a species new to Britain; also *O. nigrina* Wat. (with a type lent by Mr. E. A. Waterhouse), to demonstrate that it is not synonymous with *sericea* as stated on the Continent; and *O. exigua* which is also there regarded as synonymous with *nigrina*.—Mr. Hugh Main and Mr. Albert Harrison, a long series of *Colias edusa*, with var. *helice*, bred from one female *helice* sent by Dr. T. Chapman from the South of France, to show the proportion of type and variety obtained; and the results of similar experiments with *Amphidasys betularia*, bred from a male var. *doubledayaria* and a type female taken at Woodford, Essex, in 1903.—Mr. R. Priske, a specimen of *Helops striata*, with a photograph, showing an abnormal formation of the right antenna, which was divided into two branches from the fifth joint.—Mr. Percy H. Grimshaw, examples of *Hydrotæa pilipes*, Stein, male and female, the latter sex being previously unknown; and several specimens of *H. tuberculata*, Rond, not hitherto recorded in Britain, captured by T. Dale and Dr. J. H. Wood in various localities.—Dr. F. A.

Dixey, some cocoons and perfect imagines of hybrid *Saturniids*, including female and male of *S. pavonia*, L. \times *S. pyri*, Scheff., with added specimens of both sexes of the parent forms for comparison, the cross product resembling a large *S. pavonia* rather than a small *S. pyri*. The exhibit further included three males and three females, of which the female parent was *S. pavonia* and the male parent a hybrid between *S. pavonia* male and *S. spini* female, viz. the cross product to which Professor Standfuss has given the name *S. borne-manni*. These six individuals had been reared from ova supplied by him, and Dr. Dixey gave an account of their life-history. The remaining four examples of the hybrid = *S. schaufussi* disclosed far less strongly marked sexual differences than in *S. pavonia*.—Professor E. B. Poulton, F.R.S., groups of synaposematic Hymenoptera and Diptera captured by Mr. A. H. Hamm; three broken specimens of *Papilio hesperus*, taken at Entebbe in 1903, by Mr. C. A. Wiggins, showing that the tails of a *Papilio*, if untouched by enemies, can endure a great deal of wear; and Nymphaline butterflies from Northern China, apparently mimetic of the male *Hypolimnas misippus*, which is not known to occur in that region. The President, a number of examples of *Pyrameis atalanta* and a pair of *Aglaias urticae*, illustrating the effects of cold season breeding, by Mr. Harwood of Colchester.—Mrs. De la B. Nicholl read a paper on "Butterfly-hunting in British Columbia and Canada," illustrated by numerous examples of the species captured during the summer of 1904.—Sir George Hampson, B.A., F.Z.S., communicated a paper on "Three Remarkable New Genera of Micro-Lepidoptera."—Mr. Herbert Druce, F.L.S., F.Z.S., a paper entitled "Descriptions of Some New Species of Diurnal Lepidoptera, collected by Mr. Harold Cookson in Northern Rhodesia in 1903-4; Lycænidae and Hesperidae by Hamilton H. Druce, F.Z.S."—Mr. F. DuCane Godman, F.R.S., D.C.L., a paper entitled "Descriptions of Some New Species of Satyridæ from South America."—Mr. W. L. Distant, a paper entitled, "Additions to a Knowledge of the Homopterous Family of Cicadidæ."—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 9th, 1905.—Mr. Hugh Main, B.Sc., F.L.S., President, in the chair. — A special exhibition of *Hybernia defoliaria* males had been arranged, and series were shown by Messrs. Rayward, Pratt, Crow, Browne, Hickman, Harrison, Main, Goulton, and Tonge. The variation ranged from uniformly dark forms to uniformly light ones, with considerable variation in widths and colour of the transverse markings. It was noted that the males migrated in large numbers, but no well ascertained facts were known as to the distribution of the females.—Mr. Rayward, living females of *H. rupicaprararia* from Wallington.—Mr. Crow, on behalf of Mr. Hickman, the whole of the imagines and varieties bred from the brood of *Arctia caia*, referred to at the Exhibition of Varieties in November, 1904. Several extreme forms had scarcely any white or light markings, and yet the usually dark markings appeared through a veil of semitransparent smoky scales. There were no intermediates. — Mr. Kaye, two forms of the rare *Heliconius pasithoë* from the Demarara River.—Mr. Adkin, a series of *Lycæna (Cupido) minima*, taken last year at Eastbourne, and showing an unusual amount of blue in the males.—Mr. South, a long series of very varied

specimens of *Gelechia populella*, taken on birch trunks at Oxshott on Aug. 20th, 1904. He also showed a hybrid between *Anthrocera* (*Zygana*) *filipendulæ* female \times *A. trifolii* male, and contributed the following note:—The specimen of *Zygana* exhibited was reared from eggs deposited by a female *Z. filipendulæ* that had paired with a male *Z. trifolii*. The parents, also exhibited, were one of the four cross pairs to which reference was made at a meeting of the Society held on Oct. 22nd, 1903 (see also Entom. xxxvii. 15). Although all the eggs hatched, and the larvæ, over 100 in number, appeared at first to be doing fairly well, they gradually died off until there appeared to be only a few that seemed likely to survive the winter. In the spring of 1904 it was found that only four larvæ gave any promise of completing their metamorphoses, but two of these ultimately disappeared; the other two formed cocoons in due course, but only one imago emerged, and this was unable to clear itself properly from the pupal case. The specimen therefore is imperfectly developed, and each antenna is still encased in the pupal sheath. However, it is evident that the offspring has inherited characters of each parent, but in a modified form. The sixth spot of the fore wings is present, but only faintly discernible (in the female parent this spot is unusually large, and united with spot 5); the border of the hind wings is much broader than in *Z. filipendulæ*, but not quite so broad as in *Z. trifolii*. Altogether the specimen closely resembles the form of *Z. filipendulæ* known as var. *hippocrepidis*.—Mr. Edward, two male examples of the rare *Papilio blumei*, from Celebes.—Mr. Priske, an example of *Calosoma sycophanta*, recently picked up in Kew Gardens.—Dr. Chapman, a long series of bred *Hastula* (*Dichelia*) *hyerana* and its dark var. *marginata*, a Tortrix from the South of France, together with a quantity of details of its life-history, including larvæ in each instar, pupa-cases, stems of asphodel showing the ravages, photographs of ova, microscopical slides showing tubercles, &c., and read a paper on the exhibit.

February 23rd.—The President in the chair.—Mr. G. H. Briault, of Acton, was elected a member. — There was a special exhibition of *Hybernia marginaria* (*progemmaria*). — Messrs. Harrison and Main, series from (1) Epping Forest, mostly typical; (2) neighbourhood of Liverpool, including a number of var. *fuscata*; (3) Delamere Forest, only a few var. *fuscata*. — Mr. Tonge, series from Tilgate Forest and Reigate, with some very prettily variegated forms from the latter place.—Mr. Priske, a short series from Richmond Park, including one specimen with the basal half of the fore wings dark, and the only example of southern origin approaching var. *fuscata*.—Mr. Adkin, bred series from Yorkshire, and read notes on the brood, together with series from Rannoch, Kent, and Surrey. — Messrs. Dennis, Rayward, Edwards, and Turner also exhibited series from various southern localities. — A discussion took place, and it was noted (1) that all the southern specimens had light hind wings, while in all var. *fuscata* forms they were dark; (2) all but var. *fuscata* had the submarginal row of light wedge-shaped marks on the fore wings; and (3) a general absence of intermediate forms between the general type and the dark var. — Mr. Priske, a specimen of *Helops striatus* in which the left antenna was bifurcated about one-third of its length from the apex.—

Main exhibited specimens of various species of scorpions, and also a specimen of the king-crab (*Limulus*), and by means of a series of

diagrams showed that many of their characters appeared to point out a somewhat closer relationship than was formerly considered to be the case.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The second ordinary meeting of the session was held in the Royal Institution, Liverpool, on Monday, February 20th, Mr. Richard Wilding, Vice-President, in the chair.—Mr. G. Lissant Cox, of Oxtun, was elected a member of the Society.—Donations to the library were announced from Messrs. J. W. Carter, F.E.S., H. B. Score, F.R.G.S., and E. J. B. Sopp, F.R.Met.S.—A paper was communicated by Mr. William Mansbridge, F.E.S., on "The Tortrices of the Liverpool District," in which, in addition to the enumeration of the species met with, much valuable information was given on the habits of many of the more noteworthy insects, both in the larval and imaginal states. Several allied groups of the Micro-Lepidoptera were also discussed, and notes of considerable interest relating to life history given. Altogether four Pyrales, six Crambidae, three Pterophori, forty-three Tortrices (of which fifteen were bred), and twenty-six Tineæ were dealt with. The Chairman congratulated Mr. Mansbridge on his paper, and the Society on possessing such a keen worker amongst the Micro-Lepidoptera of the district. After remarks by Messrs. F. N. Pierce, W. H. Holt, and Dr. J. Cotton, a hearty vote of thanks was accorded the lecturer.—Amongst the many interesting exhibits on view were the following:—Several cases of Micro-Lepidoptera, to illustrate the paper, including fine series of *Phycis fusca*=*carbonariella*, *Ephestia elutella*, *Teras contaminana*, *Dictyopteryx bergmanniana* (a very pallid form), *Catoptria æmulana*, &c., by Mr. Mansbridge; varieties of *Abraaxas grossulariata*, including fine light forms, in which the dark markings were almost obliterated, by Mr. Mountfield; *Morpho cypris* (Columbia), *Caligo telemonius*, *Hypolimnas salmacis*, and *Dismorphia nemesis* (South America), by Mr. J. J. Richardson, who also showed a live specimen of *Dermestes peruviana* from Liverpool; *Antoricum sulcatum* (Oliv.), and *Longitarsus æruginosus*, and other recent additions to the British list, by Mr. W. E. Sharp, F.E.S.; *Edemera virescens*, L. (pair), and *Malachius barnvillei*, Putore, recent additions to the British list, and a specimen of the very rare *Bagous lutosus*, Gyll., by Mr. W. Thouless, F.E.S.; *Anchomenus gracilipes*, Duft, of which only one or two specimens have been recorded for Britain; *Quedius nigrocaruleus*, Rey, of which only three British specimens are known; and *Bembidium quadripustulatum*, one of the rarest of our Bembidia; all three species captured and exhibited by Mr. E. C. Bedwell, F.E.S.; *Triplax bicolor*, Gyll. (with *T. russica* and *T. ænea* for comparison), recently reinstated in the British list on its occurrence to Mr. R. S. Bagnall, for whom the insects were exhibited by the Secretary. *Leucophæa surinamensis*, an exotic cockraoch, just received from the Liverpool Docks, was shown by Mr. Sopp.—E. J. B. Sopp and J. R. LE B. TOMLIN, *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—February 20th, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Annual Meeting. The various annual reports were received, and the officers and council were elected for the ensuing year.—Mr. W. E. Collinge, The University, was elected a member.—A resolution was carried to invite the following

gentlemen to become honorary members of the Society:—Mr. H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; Rev. F. D. Morice, M.A., F.E.S.; Messrs. E. Saunders, F.R.S., F.L.S., F.E.S., and J. W. Tutt, F.E.S.—Mr. G. H. Kenrick exhibited a few insects collected by himself in the North of Scotland last year in the intervals of shooting; he said the most interesting perhaps were nice silvery forms of *Larentia autumnata*, Bkh. They also included *Calocampa solidaginis*, which was not uncommon, and *Anaitis paludata* var. *imbutata*, Hb.—Mr. J. T. Fountain exhibited *Adopæa thaumas* (*linea*) and *A. lineola*, taken together in the Wye Valley; also bred *Actias selene*, Hb., reared in this country from Indian ova.—Mr. A. H. Martineau exhibited a spray of oak with three different kinds of galls on close together; they were probably made by *Neuroterus lenticularis*, Ol., *Andricus fecundatrix*, Hart., and *Dryophanta divisa*, Hart.; he also showed *Pemphredon lethifer*, Schenck., bred from bramble-stems gathered at Marston Green, together with its parasites, the chrysid *Ellampus auratus*, L., and the ichneumon *Perithous divinator*, Rossi.—Mr. W. Harrison showed a nice series of *Eriogaster lanestris*, L., bred from a brood of larvæ found at Trench Woods; some had emerged in 1902, and others in 1904.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

HAWAIIAN ENTOMOLOGICAL SOCIETY.—A preliminary meeting was held in December last, and the constitution of the Society was formulated on January 26th. The following are the officers for 1905:—President: R. C. L. Perkins (Supt. of Entomology, Hawaiian Sugar Planters' Experimental Sta.), who appointed Alexander Craw (Supt. of Entomology, Bureau of Agriculture and Forestry) as Vice-President; Secretary and Treasurer: Jacob Kotinsky (Asst. Entomologist, Bureau of Agriculture and Forestry); Committee: D. L. Van Dine (Entomologist U.S. Experiment Sta.), and Otto H. Swezey (Asst. Entomologist, Hawaiian Planters' Sta.). Twelve members constitute the Society so far, which meets the first Thursday in every month, at the Bureau of Agriculture and Forestry, Honolulu, 7.30 to 10 p.m., for the study of the Arthropoda, especially of the Pacific Region.—G. W. KIRKALDY.

OBITUARY.

With much regret we have recently heard that Mr. Alfred Beaumont, of Gosfield, Essex, died early in March of this year. He was a most indefatigable worker, and his interest was extended to all orders of the Insecta, although Coleoptera was possibly his strong point. He was especially keen in his investigations, and was sometimes rewarded by the discovery of additions to the British lists of Diptera and Hymenoptera, or more frequently by the capture of very rare species in those orders or in Coleoptera. There are many notes from his pen in the 'Entomologists' Monthly Magazine' subsequent to the year 1882; and there are also a few of his contributions in the 'Entomologist,' the latest of which was published in the number for December, 1904. He was a Fellow of the Entomological Society of London, and one of the oldest, having been elected in 1851. A man of high principle, steadfast courage, and great tenacity of purpose, Mr. Beaumont was highly esteemed by all who knew him.

THE ENTOMOLOGIST

VOL. XXXVIII.]

MAY, 1905.

[No. 504.]

DESCRIPTION OF A NEW SPECIES OF CICADIDÆ.

By W. L. DISTANT.



Subfam. GÆANINÆ.

Div. GÆANARIA.*

Gæana vestita, sp. n.

♂. Body and legs black; head with an oblique spot on each side of vertex at inner margins of eyes, mesonotum with a curved transverse series of four spots, and two central spots to cruciform elevation golden yellow; posterior abdominal segmental margins narrowly luteous; abdomen beneath with two discal spots on second, third, fourth, and fifth segments and an apical lateral spot on each side, stramineous; tegmina black on basal, dark fuscous on apical area with the venation black; radial area, large elongate spots in the two lower ulnar and claval areas, and a broad transverse fascia near middle, stramineous; wings with more than basal half stramineous,

ENTOM.—MAY, 1905.

L

remaining area dark fuscous with the venation black; rostrum just passing the intermediate coxæ; opercula small, obliquely transverse.

Long. excl. tegm. ♂, 40 millim. Exp. tegm. 102 millim.

Hab. Yunnan; Yunnansen (Excoffier; Paris Mus.).

This beautiful species is allied to *G. sulphurea*, Hope.

BUTTERFLIES COLLECTED BY SURGEON LAMBERT,
R.N., AT VLADIMAR BAY, &c., AUGUST, 1897.

By HENRY CHARLES LANG, M.D., F.E.S., M.R.C.S., &c.

THIS small collection came into my hands through Mr. O. E. Janson in 1900; it consists of one hundred and five specimens, collected by Surgeon Lambert at Vladimar Bay, in Russian Tartary, between the dates of August 1st and 9th, 1897, and a few from Port Hamilton, in Corea, on June 16th and 17th of the same year. Owing to the care with which these specimens were labelled, I am able to give the exact dates. He also collected in Japan and China, but at the time of seeing the collection I was not interested in these latter, as I did not then consider that the butterflies of Japan and China should be included in the Palæ-arctic Region, though I have now altered my views in this respect as regards Japan.

PAPILIONIDÆ.

Papilio xuthus, L.—Eight males, one female; August 5th to 8th, 1897. Vladimar Bay. On comparing these with four males and five females from Pryer's collection, taken near Tokio, I find that the Japanese specimens differ as regards the males from those from Vladimar Bay in having the marginal band of the hind wings broader, and reaching to the discoidal cell, just as in *P. machaon* var. *sphyrus*. Four of the Japanese females differ in no way from that from the Amur, and the fifth only in being somewhat larger, and in the deeper yellow of the ground colour.

P. machaon, L.—One female; August 3rd, 1897. Vladimar Bay. Differs in nothing from ordinary large European specimens; expanse, 3½ in. Certainly not to be considered as var. *hippocrates*.

P. bianor, Cram.—One female. Port Hamilton, Corea, June 16th, 1897. The ordinary typical form.

P. bianor var. *maackii*, Mén.—Vladimar Bay. Two males, August 8th and 9th, 1897; two females, August 9th, 1897. These resemble specimens from Japan.

Parnassius nomion, Fisch.—Vladimar Bay. Two males, August 5th and 6th, 1897; three females, August 5th and 9th, 1897.

PIERIDÆ.

Pieris rapæ, L.—Vladimar Bay. One female, August 8th, 1897—usual typical form; one female, August 8th, 1897—var. *orientalis*,

Oberth. Larger, bases of anterior wings dusky; resembles some of Pryer's specimens from Japan.

P. melete, Mén.—Vladimar Bay. One male, August 5th, 1897.

Leptidia sinapis, L., gen. æst. *diniensis*, B.—Vladimar Bay. One male, August 9th, 1897. This specimen differs in no way from European examples.

L. amurensis, Mén.—Vladimar Bay. Two specimens, August 5th; two, August 8th; one, August 9th; two without date. These seven specimens do not differ from those in a series of twenty-eight specimens taken by Pryer at Oi-waki, Japan, or from others received from the late Dr. Staudinger from the Amur. I have never been able to understand why Staudinger should suggest that *amurensis* is a var. of *sinapis*, and yet gives *duponcheli* specific rank. From Vladimar Bay it will be noticed that we have *sinapis* in its summer form, taken at the same time as *amurensis*, which is altogether different in its appearance and conformation.

Colias hyale var. *poliographus*, Mots.—Port Hamilton, Corea. June 6th, 17th.

C. aurora, Esp.—Vladimar Bay. August, 1897. One worn female.

Nymphalidæ.

Limenitis sydi var. *latefasciata*, Mén.—Vladimar Bay. One female, August 8th, 1897.

Melitæa plotina, Brem.—Vladimar Bay. One female, August 6th, 1897.

Argynnis selene, Schiff.—Vladimar Bay. One female, August 6th, 1897.

A. daphne, Schiff.—Vladimar Bay. Ten males, August 5th; one male and three females, August 8th. The males are smaller, and both sexes are less vividly fulvous than the specimens taken by myself in Provence and Hungary.

A. aglaia var. *fortuna*, Jans.—Vladimar Bay. One female, August 9th, 1897.

A. adippe var. *xanthodippe*, Fixs.—Vladimar Bay. Two males, August 5th; one, August 3rd, one female which I put down to this var., as the silvery markings are absent except the marginal lunules. Some specimens of this come very near to the Spanish ab. *cleodippe*. This form differs from the next, not only in the absence of the silvery spots, but in having the androconia on veins 2 and 3 of the fore wings. A form received from Staudinger in 1898 from Kentei resembles the above, and was named *cleodippe*. The present edition calls it *xanthodippe*, retaining *cleodippe* for the Spanish var.

? *A. adippe* var. *pallascens*, Butl.—Vladimar Bay. Two males on August 1st, and six on August 5th; one female, August 3rd. I place these under this head on the strength of Staudinger's remark, "*♂* lunul. marginalibus argenteis." All these males have the androconia only on vein 2. Mr. Elwes (Trans. Ent. Soc. 342, 1899) says: "Those with the androconia only on vein 2 seem to occur in Amurland, Korea, and in North and Central China and Japan." He expresses an opinion that they may belong to another species. It is to be remarked that typical *adippe* and vars. *cleodoxa* and *chlorodippe* have

the androconia on veins 2 and 3. In 1898 I received a form from the Transbaical named *chrysodippe*, with the androconia as in the present form.

A. laodice, Pallas.—Vladimar Bay. Four males, August 5th, 8th, 9th, 1897. These do not differ from European specimens except in the paleness of the colour of the upper surface.

Melanargia halimede, Mén.—Vladimar Bay. Three males, three females, August 5th, 1897.

M. meridionalis, Feld.—One male, Port Hamilton, Corea, June 17th; two males, four females, Vladimar Bay, August 3rd, 5th, and 8th.

Satyrus dryas, Esp.—Vladimar Bay. Four males, August 8th, 1897. Three of these have the under side of hind wings unicolorous.

Pararge achine, Sc., var. *achinoides*, Butl.—Two females, rather worn; August 5th, 1897, Vladimar Bay. ("Var. major, ocellis majoribus," St. Cat.).

Aphantopus hyperanthus, L., var. *ocellatus*, Butl.—One male, three females, August 5th, 1897, Vladimar Bay. These agree with Staudinger's remark, "major, subt. obscurior, ocellis majoribus," as regards the ocelli, which are larger; but the ground colour is certainly not "obscurior," but rather lighter than usual.

Ctenonympha edippus, F.—Vladimar Bay. Two males, August 5th, 1897. These do not in any way differ from European specimens. I think that it is worthy of remark that the three species last enumerated, which have so strong a superficial resemblance to one another, should have all been taken in the same locality, and at the same time.

LYCENIDÆ.

Chrysophanus dispar, Haw., var. *auratus*, Leech.—One male, one female, August 8th, 1897, Vladimar Bay. These exactly tally with Standinger's diagnosis ("♂ supra impunctatus, ♀ al. post. nigricantoribus; sub. al. post. griseis, non cærulescentibus"). This appears to me much nearer the true British type than the Euro-Asiatic *rutilus* in the general appearance and size, and in the width of the submarginal band on the under side hind wings; but there is only a trace of a discoidal spot in the male, and an entire absence of the blue basal shading found in true *dispar*. The hind wings of the female above more resemble those of female *hippotoe*.

C. hippotoe, L., var. *amurensis*, Stgr.—Two males, rather worn, Vladimar Bay, August 8th and 9th, 1897. This var. is distinguished from the type by its larger size, more brilliant colour, and by a double discoidal spot on the hind wings. It greatly resembles var. *caudens* as far as the male is concerned, but has less of the violet reflection seen in that form.

Lycena arygyronomon, Bgst.—Vladimar Bay. Two males, rather large and brightly coloured, August 5th, 1897.

L. cleobis, Brem.—Vladimar Bay. Two males, five females, August 8th, 1897. A very variable species.

L. euphemus, Hb., var. *obscurata*, Stgr.—Vladimar Bay. Three females, rather worn, August 6th.

PAPILIO STEINBACHI, SPEC. NOV.

BY THE HON. WALTER ROTHSCHILD.

Allied to *P. quadratus*, Staud.

♂. Fore wing a little broader than in *quadratus*; no fringe-spots; a white patch divided by M^2 , not reaching to M^1 , but occasionally extending to SM^2 . Hind wing strongly dentate, subcaudate; a row of spots round apex of cell from R^2 to (SM^1), and a dot in cell, which is sometimes missing, posterior spot and base of spot M^1-M^2 white, the other spots red; fringe-spots white; wool in abdominal fold short, dirty grey, no tuft of spreading hairs at base of fold as is the case in *quadratus*; vein M^2 much less distal than in *quadratus*. Under side like upper, a little paler, white spots of fore wing somewhat larger, spots of hind wing much paler, an additional red spot at anal angle. Palpus and abdomen quite black.

♀. Fore wing with a large white patch traversed by veins M^1 and M^2 , and a minute spot in cell; no fringe-spots. Hind wing with white fringe-spots; a red band distally of cell from near R^1 to (SM^1), spot R^3-M^1 being the longest, last spot slightly white at posterior edge. Under side of fore wing like upper, but paler; band of hind wing pale rosy pink, last spot and bases of the two preceding ones whitish pink, a separate red spot close to anal angle. Palpus black, eighth sternite of abdomen and edge of seventh red (vaginal spot).

Herr J. Steinbach found four males and one female of this interesting species near Santa Cruz de la Sierra, East Bolivia, between February and June, 1904.

NOTES ON LEPIDOPTERA IN 1904.

BY J. C. F. & H. F. FRYER.

As far as our experience went the season of 1904 was below the average, especially in "Micros," possibly owing to the cold and wet of the previous year.

Two facts were remarked, and are perhaps worth mentioning—a greater tendency than usual in all variable species to produce dark forms—and the prevalence in many species of more than the usual number of broods, the latter perhaps on account of the long hot summer. For instance, among such species as *Orrhodia ligula* (*spadicea*) and *Anchocelis pistacina* several freshly emerged *Leucania pallens* seemed sadly out of place. Various localities such as Monk's Wood, Wicken, and the Norfolk Broads were well worked, but only in the daytime, and nothing of general interest was obtained. Sugar and light were also given a good trial in the neighbourhood of Chatteris, but the fact that there are no woods or fens near probably accounts for the

absence of any species worthy of remark, for, although most of the commoner Noctuæ were abundant, one specimen of *Acronycta strigosa* was the only rarity taken. The number of species observed was upwards of four hundred, but the following only seem to deserve mention :—

Sesia formiciformis.—This species appears to occur plentifully in nearly all willow-holts, but we find it hard to obtain in good condition. *Trochilium bembeciformis*, which usually occurs with it, is easily bred, but the few larvæ of *S. formiciformis* which we have taken have died in the willow-stumps before becoming pupæ.

Acronycta strigosa.—One specimen at sugar near Chatteris. As far as we are aware, this is the only record for some thirty years in this district. When it is remembered that its food-plant (hawthorn) is so universally distributed, and that the species is reported to be not hard to breed in confinement, it seems curious that it should occur so infrequently.

Senta maritima (ulvæ).—Although the food-plant is common in the district, this species occurs in one locality only, and that one of extremely limited extent. It would seem natural to attribute the absence of this and other reed species such as *Leucania straminea* and *L. obsoleta* to the fact that the reeds are cut nearly every year when the dykes are cleansed, but if this be so, it is difficult to explain the profusion of *Calamia phragmitidis*, which feeds in a very similar way.

Cænobia despecta.—The above remark applies as to locality, but *despecta* occurs there in much greater numbers. The insect appears to be confined to that part of the habitat where the food-plant is liable during a considerable portion of the year to be covered with water. Last year we succeeded in breeding several specimens from plants of *Juncus lamprocarpus* (?).

Hydracia nictitans.—Noted only on account of the occurrence of the greyish yellow form at Hunstanton, and one of a dark chocolate at Waxham. It is strange that, considering that the localities are so very similar in character, that not a single dark specimen was taken at Hunstanton, nor yellow one at Waxham.

Noctua xanthographa.—Occurred at Waxham in immense numbers. On each of thirteen posts there was an average of over thirty insects on several evenings, so that there was really no room for any other species.

Aglossa cuprealis.—Plentiful in one cake and meal granary. We have endeavoured to establish "colonies" in similar situations, but hitherto without much success.

Accentropus niveus.—About thirty years ago this occurred in large numbers at light. Since then, although the dykes containing its food-plant have many times been diligently searched, no specimen has been seen. Our surprise was therefore great on taking a single specimen at an acetylene light exposed on the top of a house between fifty and sixty feet high, the house itself standing some twenty-five feet above the level of the surrounding fen-land. One would hardly associate such powers of flight with this insect.

Crambus salinellus.—A single specimen at Weybourne, and that a variety. Although we have collected in salt-marshes for years, we have not found the way of taking this species.

Bactra furfurana.—Hunstanton. Very local and very small in size in the locality in which we found it.

Ephippiphora inopiana.—Weybourne, among *Inula* and *Artemisia*. Both have been mentioned as its food-plant, but we are uncertain on which it feeds.

Xanthosetia zægana.—Chatteris. Besides the type there was a noticeable proportion of the form *ferrugana*, as well as forms intermediate between the two.

Conchylis alternana.—Waxham. Taken on heads of *Centaurea*.

Anesychia funerella.—Common in the fen-dykes around Chatteris, both larva and imago, but for some reason we have not succeeded in breeding it.

Depressaria flavella.—For the last two years we have bred this species, together with *Sciaphilæ*, from the spun-up heads of *Ranunculus*, as well as from rolled leaves of *Centaurea*. Two kinds of larvæ were noticed, a pink one and a dark green; neither of these, however, on pupation, attained the size of the *flavella* larva when feeding on its usual food-plant, *Centaurea*.

Depressaria badiella.—A curious form of this species was also bred from the buttercup-heads above referred to, the larva having been probably introduced by mistake.

The Priory, Chatteris: April 6th, 1905.

CURRENT NOTES.

By G. W. KIRKALDY.

(Continued from p. 58.)

1. E. KRODEL: "Durch Einwirkung niederer Temperaturen auf das Puppenstadium erzielte Aberrationen der *Lycæna*-arten" (Allgem. Zeitschr. für Entom. ix. pp. 49-55, 103-110, 134-7; text-figs. 1-21. (Feb. to April, 1904) [Lepidoptera]).
2. H. SCHOUTEDEN: "Faune entom. de l'Afrique tropicale: *Rhynchota æthiopica*" i. (Ann. Mus. Congo Zool. (iii.) i. pp. 1-131; Index and Corrigenda; pls. i. and ii. (Nov. 1903) [Hemiptera]).
3. W. W. FROGGATT: "Locusts and Grasshoppers, part 2" (Agr. Gaz. N.S. Wales, xv. pp. 240-3, with coloured plate (unnumbered) (March 2, 1904) [Orthoptera]).
4. F. M. JONES: "Pitcher-Plant Insects" (Ent. News, xv. pp. 14-7; pls. iii. and iv. (Jan. 1904)).
5. M. GILLMER: "Ein gynandromorphes Exemplar von dem Hybriden *Smerinthus hybridus*, Stephens" (1850) (Allg. Zeitschr. f. Ent. ix. pp. 140-3; text-figs. 1-3. Apl. 15, 1904) [Lepidoptera]).
6. E. P. VAN DUZEE: "Annotated list of the Pentatomidæ

- recorded from America, North of Mexico," &c. (Trans. Amer. Ent. Soc. xxx. pp. 1-80 (1904) [Hemiptera]).
7. W. M. SCHOYEN: "Beretning om Skadeinsekter og Plantesygdomme"; 1903 (Aarsher, Offent. Foranst. Landbr. Fremme; [sep. p. 1-36] (1904).
 8. T. W. KIRK: "Rep. Biology," &c. (11th Rep. Dep. Agr. 1903, pp. 363-461; 40 plates and 5 text-figs. (1903)).
 9. "PROC. 16TH ANNUAL MEETING ASSN. ECONOMIC ENTOMOLOGISTS" (Bull. Div. Ent. U.S. no. 46, pp. 1-113; plates i. and ii.; 1 text-fig. (1904)).
 10. E. D. SANDERSON: "Report of the Entomologist" (14 Ann. Rep. Delaware Agr. Exp. Sta. for 1902, pp. 109-51; figs. 10-16 (1903)).
 11. W. E. BRITTON: "3 Rep. State Entom." (Rep. Connecticut Agr. Exp. Sta. for 1903, pp. i-iv and 199-286, pls. i.-viii.; text-figs. 27-42 (1904)).
 12. C. S. BANKS: "Preliminary Bulletin on Insects of the Cacao" (Bul. Biol. Lab. Dep. Interior Philippine Isles, no. 1, pp. 1-58; coloured frontispiece, and figs. 1-60 (totalling 51 plates) (1904)).
 13. J. H. MAIDEN: "The Flora of Norfolk Island, part 1" (Proc. Linn. Soc. N.S.W., xxviii. pp. 692-785, pl. 38 (April 28th, 1904)).
 14. F. L. WASHBURN: "Injurious Insects of 1903" (Bull. Minnesota Agr. Exp. Sta. 84, pp. i-viii and 1-184; coloured plate and text-figs. 1-119 (Dec. 1903)).
 15. H. A. BALLOU: "Further Notes on Pests attacking the Cotton Plant in the West Indies" (West Indian Bull. iv. pp. 326-48 (1904)).
 16. D. SHARP: "Description of a new Genus and Species of Coleoptera (Family Hispidæ) from New Britain" (Proc. Linn. Soc. N.S.W. xxviii. pp. 924-5 (April 28th, 1904)).
 17. F. MUIR & D. SHARP: "On the Egg-cases and Early Stages of some Cassididæ" (Tr. Ent. Soc. Lond. pp. 1-23, pl. i.-v. (April 27th, 1904) [Coleoptera]).
 18. C. L. MARLATT: "Importations of Beneficial Insects into California" (Bull. U.S. Div. Ent. 44, pp. 1-99, text-figs. 1-19 (1904)).
 19. O. F. COOK: "An Enemy of the Cotton Boll Weevil" (Rep. U. S. Dep. Agric. 78, pp. 1-7 (May 27th, 1904) [Hymen. and Col.]).
 20. C. SASAKI: "On the Wax producing Coccid, *Ericerus pe-la*, Westwood" (Bull. Col. Agr. Tokyo Imp. Univ. vi. pp. 1-13, pl. 1-2 (coloured) (March, 1904)).
 21. F. E. BEMIS: "The Aleyrodids, or Mealy-winged Flies, of California, with references to other American Species" (Proc. U.S. Mus. xxvii. pp. 471-537, pls. 27-37 (1904)).
 22. T. PERGANDE: "On some of the Aphides affecting Grains

- and Grasses of the United States" (Bull. U.S. Div. Ent. 44 pp.).
23. G. LEONARDI: "Generi e specie di Diaspiti" (Ann. Scuola Agric. Portici, v. 1903) [Hemiptera].
 24. P. SPAULDING: "Two Fungi growing in Holes made by Wood-boring Insects" (15th Ann. Rep. Missouri Bot. Gardens, pp. 73-7, pls. 25-7 (1904) [Col.]).
 25. H. OSBORN: "The Economic Status of the Fulgoridæ" (Proc. 25th Meeting Soc. Prom. Agr. Sc. pp. 32-6 (1904) [Hem]).
 26. A. H. KIRKLAND: "Usefulness of the American Toad" (Farmers' Bull. 196, U.S. Dep. Agr. pp. 1-16 (1904)).
 27. H. E. HODGKISS: "The Life-history Treatment of a Common Palm Scale (*Chrysomphalus dictyospermi*, Morgan)" (41st Ann. Rep. Massachusetts Agr. Coll. [Publ. Doc. 31], pp. 95-106, pls. 1 and 2 (Jan. 1904)).
 28. R. A. COOLEY: "First Annual Rep. State Entom." (Bull. Montana Agr. Exp. Sta. 51, pp. 199-274; frontispiece and pls. i.-vii.; text-figs. 2-10 (Jan. 1904)).
 29. G. A. BAER: "Note sur un Membracide, myrmécophile de la République Argentine [Hemipt.]" (Bull. Soc. Ent. France, 1903, pp. 306-8).
 30. J. G. SANDERS: "Coccidæ of Ohio, I." (Ohio State Acad. Sci., Special Papers 8, pp. 25-92, pls. 1-9 (May 16th, 1904) [Hem.]).
 31. J. R. DE LA TORRE BUENO: "A Palæarctic Notonecta" (Ent. News, xv. 220-1 (June, 1904) [Hem.]).
 32. C. SASAKI: "On the Feeding of Silkworms with the Leaves of *Cudrania triloba*, Hance" (Bull. Coll. Agr. Tokyo Imp. Univ. vi. pp. 15-9, pls. 3 and 4 (March, 1904)).
 33. DITTO: "Corean Race of Silkworms" (*op. cit.* 21-6, pl. 5).
 34. DITTO: "The Beggar Race (Kojikiko) of Silkworms" (*op. cit.* 27-31).
 35. DITTO: "Double Cocoon Race of Silkworms" (*op. cit.* 33-6, pl. 6).
 36. DITTO: "On the Feeding of the Silkworms with the Leaves of wild and cultivated Mulberry-trees" (*op. cit.* 37-41).
 37. DITTO: "Some Observations on *Antheræa* (*Bombyx*) *yamamai*, G. M., and the Methods of its Rearing in Japan" (*op. cit.* 43-50, pl. 7).
 38. C. M. WEBB: "The Brown-tail Moth in New Hampshire" (Bull. N. H. Agr. Sta. 107, pp. 45-60, text-figs. 1-10 (Feb. 1904) [Lepid.]).
 39. DITTO: "The Pernicious or San José Scale in New Hampshire" (*op. cit.* 109, pp. 73-83, text-figs. 1-3 (March, 1904) [Hem.]).

Krodel (1) discusses the aberrations of *Lycæna corydon* and *damon* caused by low temperature experiments on their pupæ. Twenty-one under sides are figured.

Schouteden (2) has published the first part of a proposed monograph of the Ethiopian Hemiptera, prepared on the largest scale. In this the Scutellerinæ and Graphosomatinae subfamilies of the Cimicidæ are detailed, with two finely coloured plates.

E. P. Van Duzee (6) has given us a much-needed list of the Cimicidæ (or Pentatomidæ as he calls them) of North America, twelve species and one variety being here added. 191 species are recorded, 163 being known to the author. The paper is characterized by extreme care and precision in the description and notes, but it is regretted that the author has rejected the nomenclature of Bergroth and Kirkaldy, based upon priority, and fallen back on the irregular nomenclature of Lethierry and Severin.

Schoyen (7) discusses the injurious insects of Norway during 1903, on corn, grass, cabbage, fruit-trees, &c. There are extended notes on the biology of many of the species, most of which are also British.*

T. W. Kirk's Report (8) is largely concerned with fruits and their inspection; as regards entomology, *Phylloxera* is, as usual, dealt with at some length, and there is also a brief notice (with figures) of the Fulgorid *Pochazia australis*, the vinehopper. There are also interesting notes, with photographs, of some of the South Sea Islands. "Pests and diseases are worst on the Island of Rarotonga, which appears to be a perfect paradise for all species. We understand that there is a little scale on Aitutaki, but the other islands visited are, so far as our observations went, practically free from pests, except black aphids."

The Proceedings of the recent meeting of the Association of Economic Entomologists (9) contain, as usual, a mass of interesting details on all topics. O. H. Swezey presents observations on the life-history of *Liburnia campestris* and *lutulenta* (Hemiptera), which are parasitised by a Proctotrypid Hymenopteron, *Gonotopus bicolor*. This is the form which has recently been introduced into the Hawaiian Islands to check the ravages of *Perkinsiella saccharicida*, a Fulgorid pest on sugar-cane.

Sanderson's Report (10) deals principally with Hemiptera; the seventeen-year Cicada (*Tibicen septendecim*) and the harlequin cabbage-bug (*Murgantia histrionica*); both these are illustrated by photographs.

Britton (11) details at length the fight with the San José scale (*Aspidiotus perniciosus*) during 1903, with shorter notes on various insects.

Banks (12) publishes a bulletin on Cacao insects. This is the result of only three months' investigation, and naturally many

* I believe the reference quoted (7) is correct, but the copy before me, which I owe to the kindness of the author, has only the appearance of a separate publication. The title-page is dated 1903, but the last page is "6te Januar, 1904."

of the insects are not fully determined. The principal enemies of Cacao in the Philippines are a Cicadid which attacks the roots; a Cerambycid larva and Termites which destroy the trunk and branches; and various caterpillars and aphides ravishing the leaves.

In a monographic paper on the "Flora of Norfolk Island"—a small island almost equidistant from New Zealand and New Caledonia—Maiden (13) notes (pp. 769-70) that at present the islanders are little cursed with insect-pests. He noticed "mealy bug" on oranges and lemons, and "black scale" on Lisbon lemons. Onions are liable also to the attacks of a scale-insect, while water-melons are attacked by aphids. White ants are absent, and mosquitoes very rare.

Washburn's latest Bulletin (14) contains much information upon various entomological topics; the coloured plate contains fourteen drawings of larvæ of Lepidoptera and Hymenoptera. Ballou (15) discusses at some length the recent serious outbreaks of the cotton-worm (*Aletia argillacea*) that have been experienced in the West Indies, St. Vincent being the only cotton-growing island to escape. D. Sharp (16) describes a new beetle which has severely ravaged young palms in Beraia; "the insect deposits its eggs upon the young shoots of the plant upon which the larvæ feed."

The same author collaborates with F. Muir (17) in an important and well-illustrated paper on the metamorphoses of certain Coleoptera.

Marlatt (18) notes that the Coccinellid *Vedalia cardinalis* is maintaining its usefulness in California, being regularly bred up by Mr. Craw and others. "The rapidity with which a colony of scales is cleared up by these insects is something marvellous, a few weeks only being sufficient for it to clear up a considerable area of infestation." Of more recent importations, *Scutellista cyanea* "is apparently duplicating against the black scale the wonderful work of the *Vedalia* against the white scale in California."

O. F. Cook (19) has discovered a formidable enemy in Guatemala of the destructive cotton-boll weevil (*Anthonomus grandis*). This foe is an ant, which spreads over the cotton-fields, and, attacking the weevils, paralyses them after the manner of so many other Aculeate Hymenoptera. Arrangements are apparently being made to introduce this beneficial insect into Texas, where the ravages of the weevil have been so appalling.

Sasaki (20) concludes that the Chinese wax-scale is a native of both China and Japan. His excellent paper is illustrated by two fine plates. Miss Bemis (21) adds nineteen species of Aleyrodidæ to the North American fauna, these being described in, mostly, all their stages very fully. Pergande has (22) unravelled a vast amount of confusion in certain Aphidæ. He has

proved that *Siphocoryne avenæ*, Fabr., feeds on a great number of plants, including apple, pear, cherry, hawthorn, celery, wheat, oats, and various grasses, and is the *Aphis mali*, Fitch, *prunifoliæ*, Fitch, &c. The genuine *Aphis mali*, DeGeer, has only quite recently appeared in America. *Macrosiphum granaria*, Buckton* (formerly confused with *Siphocoryne avenæ*), *M. cerealis*, Kalt., and *trifolii*, Perg., n. sp., are fully discussed. It seems a pity to introduce "vulgar" names with almost every species, as is the custom with the American entomologists; "German grain louse," "English grain louse," and "European grain louse" are not only not distinctive, but even misleading.

The School of Agriculture in Portici, near Naples, are rapidly turning out entomological studies second to none in accuracy and thoroughness. Two of the recent publications embrace a monographical revision (23) of the *Parlatoria* and *Mytilaspis* (recte *Lepidosaphes*) groups of the Coccidæ. Unfortunately only reprints (separately paged, alas!) are before me, so that it can only be said that the *Parlatoria* paper extends to 59 pages with 16 cuts, the *Mytilaspis* 114 with 42 cuts.

Spaulding (24) remarks that the relations existing between some of the fungi and the wood-boring insects is as yet but little understood, and its economic significance probably much underrated. He states that on rotting logs of *Pinus palustris*, in Texas, two species of fleshy Agaricoid fungi were growing out numerously from the holes of wood-boring insects. The latter are present in every log in large numbers, and, although many of the holes had no fungus growing in them, the two fungi were, with a single exception, never found growing otherwise. Various other cases are cited, including the "Ambrosia-beetles," which prepare beds for and plant the spores, feeding exclusively, so far as is known, on the fruiting portions of the fungi.

Osborn (25) discusses the prominence into which the Fulgoridæ have risen through the comparatively recent discovery of their economic importance.

Montana is one of the last of the United States to appoint an entomologist, in the person of Mr. R. A. Cooley, the well-known student of Coccidæ. A large portion of his first report (28) deals with "Locusts," and with notes on fruit-pests, &c. It is largely illustrated. Baer (29) publishes a brief note on the relations between *Enchenopa ferruginea*, Buckton, and *Campotonotus punctulatus*, Mayr, with remarks on other Myrmecophiles. Bueno (31) records the occurrence, in British Columbia, of *Notopecta lutea*, Müller, a European form.

* This name cannot be considered valid, as Buckton refers his species to *granaria*, Kirby. I propose *avenivorum*, n. n.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

(Continued from p. 110.)

Nonagria arundinis (typha).—"Near Cockerham in September" (G. Loxham).

Tapinostola fulva.—Local near Rush-a-lee in September. Our local form is nearly white.

Gortyna ochracea.—"The larvæ are common near Cockerham Moss in July and August" (G. Loxham).

Hydræcia nictitans.—Common and fairly well distributed in July, August, and early September.

H. petasitis.—Near Hest Bank and Carlisle Bridge. The larvæ occur in the roots of the butter-bur (*Petasites vulgaris*) in June and July.

H. micacea.—Common everywhere in August and September, and comes to sugar and bloom freely.

Xylophasia rurea.—Common everywhere in May and June; the var. *combusta* is fairly common.

X. lithoxylea.—Comes to sugar in the County Asylum grounds, at Bowerham, Blea Tarn, &c., end of July and August.

X. sublustris.—Uncommon; near Halton, County Asylum grounds and Witherslack, in June and July.

X. monoglypha (polyodon).—Abundant and very variable in colour—from light grey to black—in June, July, and August.

Epineuron (*Neuron*) *popularis*.—Fairly common some years, not so in others; Halton, Quernmore, Blea Tarn, County Asylum grounds, &c., in August and September.

Charæas graminis.—Generally distributed but nowhere common, in July and August.

Luperina testacea.—Comes freely to street lamps in August and September, and is generally distributed.

Mamestra furva.—Local, near Clougha at sugar in July. "Fairly common at Witherslack" (G. Loxham).

M. brassicæ.—Plentiful everywhere; all through August and September the larvæ are to be found feeding upon cabbage and other Cruciferae in nearly every garden.

M. persicariæ.—I have only bred this species from Methop and Witherslack larvæ taken in September. The imago appears in June and July.

Apamea basilinea.—Fairly common in Grimshaw Lane, Blea Tarn, Bowerham, &c., in June.

A. gemina.—Fairly common and generally distributed in June and July.

A. didyma (oculea).—Abundant and very variable; comes freely to sugar everywhere in July and August.

Miana strigilis.—Fairly plentiful at sugar, County Asylum grounds, Halton, near Clougha, Blea Tarn, Bowerham, &c., in June and July. The var. *athiops* is common.

M. fasciuncula.—Fairly common at sugar at Blea Tarn, Halton, Quernmore, County Asylum grounds, &c., in June.

M. literosa.—Not common but generally distributed; comes to sugar and bloom in July and August.

M. furuncula.—Uncommon, County Asylum grounds in July.

Phothedes captiuncula.—Local, near Whitbarrow (Witherslack) and at Arnside in July and August.

Celæna haworthii.—Uncommon; I have taken odd examples at Methop and near Clougha in July.

Grammesia trigrammica (trilinea).—Not plentiful; comes to bloom and sugar in July in the County Asylum grounds and near Blea Tarn. I have bred it from Methop larvæ taken in May.

Caradrina morpheus.—Uncommon; I have only taken it in Grimshaw Lane, and bred it from larvæ (same locality) taken in September. The moth appears in June.

C. quadripunctata (cubicularis).—Fairly plentiful at sugar in late May and again in September. County Asylum grounds, Halton, Blea Tarn, Quernmore, Freeman's Wood, &c.

Rusina tenebrosa.—Fairly common at sugar, County Asylum grounds, Blea Tarn, and Halton, and I have bred it from Methop larvæ. The moth appears in June and July.

Agrotis vestigialis (valligera).—Fairly plentiful at Heysham on the flowers of ragwort (*Senecio jacobææ*), in July and August.

A. puta.—Not plentiful at Heysham in late July.

A. suffusa.—Comes to sugar in September; County Asylum grounds, Blea Tarn, &c., and is fairly common.

A. saucia.—Comes to sugar in September. Not common.

A. segetum.—Common at sugar in September; some of the forms show a tendency to melanism.

A. exclamatoris.—Common at Heysham in June; comes to sugar and bloom.

A. cursoria.—Occurs at Heysham in July.

A. corticea.—Not common about Heysham in early July.

A. nigricans.—Comes to ragwort flowers freely in July; Heysham, &c.

A. tritici.—Fairly common about Heysham in July. Comes to the flowers of the ragwort.

A. aquilina.—Uncommon; about Heysham in July and August.

Noctua glareosa.—Not common. I have taken odd specimens at Blea Tarn and in the County Asylum grounds, and bred it from Witherslack larvæ. The moth appears in August and September.

N. augur.—Common at sugar in July; Blea Tarn, Quernmore, County Asylum grounds, &c.

N. plecta.—Fairly common at sugar in July; County Asylum grounds, Grimshaw Lane, Halton, &c. I have also bred it from Methop and Witherslack larvæ.

N. c-nigrum.—Fairly common at sugar everywhere during late summer and autumn.

N. brunnea.—Generally distributed but not plentiful; comes to sugar in July.

N. festiva.—Fairly common throughout the district. I have taken it at sugar in July in nearly all the localities in which I have collected.

N. rubi.—Plentiful at sugar during August; County Asylum grounds, Quernmore, Blea Tarn, &c.

N. umbrosa.—Comes to sugar and bloom in August; County Asylum grounds, Grimshaw Lane, Blea Tarn, Freeman's Wood, &c.

N. baja.—Fairly common and generally distributed in July.

N. xanthographa.—Abundant at sugar everywhere in late July and August.

(To be continued.)

NOTES AND OBSERVATIONS.

ON behalf of the late Mr. C. G. Barrett's family, I have great pleasure in announcing that we have been able to persuade Mr. Richard South to superintend the publication of the remaining manuscripts of the 'Lepidoptera of the British Islands,' which will carry the work to the completion of the Tortricina.—C. G. B.

NOTE ON AGROTIS PUTA.—Larvæ of *A. puta*, a brood of which I have been rearing, were full-fed early in December, about the 10th, I think. They are only just beginning to pupate. The first changed on March 17th, and so far only three out of about eighty have pupated.—H. V. PLUM; The College, Epsom, March 20th.

NOTES ON TORTRIX PODANA.—Some weeks ago, finding I wanted a few specimens of *Tortrix forsterana* to complete my series, I collected about half a dozen larvæ from ivy, and placed them in a warm greenhouse to hasten their emergence. The moths began to appear early in the present month, and I was greatly surprised to find not only *T. forsterana* in the breeding-cage, but also *T. podana*. It is well known that *T. podana* is extremely polyphagous in its habits, but, with the exception of once breeding the species from yew, I have never before known it to occur on an evergreen plant. For the past two or three years *T. podana* has been very troublesome in the vineries here. The larvæ, when young, feed between united vine-leaves, and in the warmth necessary for forced vines quickly attain their full development, and if not checked thus produce two or three broods in a season. When the larvæ are about half-grown they frequently forsake the leaves of the plant and attack the fruit. At the present time, when the bunches of grapes are just setting, they not infrequently bite through the tender stalks, thus ruining the entire bunch. Later, when the grapes are about half-developed and still green, they bore into the individual berries, causing each one attacked to mould and decay. During last year I frequently noticed, in the pages of 'The Garden' and 'Gardener's Chronicle,' queries respecting a Tortricid larva which was causing great havoc in vineries. The answers almost invariably given were that the species was referable to *T. forsterana*. Judging from my own experience, I have little doubt that *T. podana* was the real culprit. The larvæ of both species are much alike, and might readily be mistaken for one another by anyone not very well acquainted with Tortricid larvæ. Whilst, however, it is most unusual for *P. podana* to be found on evergreen plants, it is equally unusual to

find *T. forsterana* on deciduous ones. Ivy is, of course, its usual food-plant, and I have also found it on laurustinus; honeysuckle is given by many authorities, but, so far as my experience goes, this is no exception to the rule, as it only occurs on *Lonicera fragrantissima*, which is an evergreen species.—E. MAUDE ALDERSON; April 11th.

THE MASON COLLECTION.—Fifteen specimens of *Deiopeia pulchella* sold at from 8/- to a guinea apiece. An example of *Emydia grammica*, from E. Shepherd's coll., together with a specimen of *D. pulchella*, said to have been taken at Camden Town, only made 10/-. A male *E. grammica* (Tunbridge Wells) 14/-, and a female of the same species from Windsor 9/-. A black aberration of *Callimorpha dominula* realized £3 10s. while another variety, with brown hind wings, made 30/-. There were a good many interesting aberrations of *Arctia caia*, and thirteen of the best of these brought in a total of £27 17s. The highest price being 5 guineas for one example, and the lowest 20/- for two specimens. The type of *Spilosoma menthastri* var. *walkeri*, Curtis, went for 21/-. Twenty-four specimens of *Lalua cænosa*, put up in pairs, sold at from 10/6 to £3 per pair. Of *Epicnaptera* (*Gastropacha*) *ilicifolia* there were ten examples, and the price for these ranged from 25/- to 70/- a couple. Twelve specimens of *Drepana harpagula* (*sicula*) from the Bristol locality made 20/- to 40/- per pair, while three males were secured for 1 guinea. *Cerura bicuspis*, of which there were eighteen Tilgate specimens, made 5/- to 15/- each. A specimen of *Glyphisa crenata* ("Isle of Man, E. G. Meek, 1870"), when offered alone did not obtain a bid, but when included with ninety-nine other specimens of desirable species, the round hundred made 20/-. Four specimens of *Leucodonta* (*Notodonta*) *bicolor* (three from Staffs, and one from Ireland), realized £8 10s. For a specimen of *Notodonta trilophus*, "reared from a larva found in Essex, J. W. Douglas," the bidding rose to £6 10s.; but another example of the same species ("Ergham, Norfolk, Gurney"), only made £2 10s., and a third specimen (from E. Brown's coll.) had to be put up with two other lots of nice *Notodonts*, when the combined lots sold for 17/-. Five *Synia muscosa* were disposed of at 5/- to 11/- each. *Leucania vitellina* sold at 7/- and 9/- a couple but single specimens included with half-a-dozen *L. turca* produced 8/-, 10/-, and 11/- per lot. The specimen of *Leucania extranea* recorded by the late Mr. W. P. Weston (Entom. xii. 19), only realized 9/-. *Nonagria sparganii*, from Dover, made 4/- to 8/- each, but four other specimens without data went for 8/-. One example of *Luperina dumerili* and one of *L. guenéei*, each with a history, fetched 12/-, and for one specimen of the last-named, from Sang's coll., 5/- was given. Four *Hydrilla palustris*, with data, sold at 22/- and 24/- per pair, while two lots, each including two males of this species, with other things, only made 7/- and 8/- the lot. The specimen of *Noctua subgothica*, from which the figure in Stephens' "Illustrations" was drawn, with another example of the same species, brought in a guinea; but the type of *Agrotis lunigera*, Steph., was bought for the Tring Museum at £3. Of *Noctua subrosea*, a moth that appears to be now extinct in Britain, there was a nice series of fourteen specimens. The first of these were the male and female types from Yaxley Fen, described by Stephens; these made £5 10s., and go into the Tring

Museum. The others were offered singly, and realized all sorts of prices, from 30/- up to £4, for specimens that might be described as decent to fine; two somewhat poor specimens only made 10/- and 14/- each.

CAPTURES AND FIELD REPORTS.

HERTFORDSHIRE COLEOPTERA.—Eight new species have been added to the Hertfordshire list during 1904 by Mr. E. G. Elliman, of The Broadway, Chesham. They are:—*Harpalus sabulicola* (Rossway, near Berkhamstead), *Ceryon nigriceps* (Tring), *Homalota consanguinea* (two examples in much-decayed beech-leaves at Tring), *Placusa pumilio* (under bark of oak at Rossway), *Myllena minuta* (Wiggington), *Catops sericatus* (taken by sweeping at Aldbury), *Coccinella hieroglyphica* (Aldbury Owers), and *Hister bissexstriatus* (St. Albans). With the exception of the last-named species, which was captured by myself, all the above were discovered by Mr. Elliman.—A. E. Gibbs; Kitchener's Meads, St. Albans.

LEPIDOPTERA IN HERTFORDSHIRE.—At a meeting of the members of the Hertfordshire Natural History Society and Field Club, held at Watford on March 29th, Mr. A. E. Gibbs, F.L.S., of St. Albans, presented a report on the Lepidoptera observed in the county chiefly during 1904. Although the season, generally speaking, was an unfavourable one, seven additional species, mostly recorded during 1904, were added to the county list. They are:—1. *Xylina semibrunnea*; four specimens taken at sugar at Baldock, in August and September, by Mr. A. H. Foster, of The Grange. 2. *Melanippe galiata*, taken by Miss Alice Dickinson at New Farm, St. Albans. 3. *Anticlea sinuata*, taken both at St. Albans by Miss Dickinson, and at Hexton by Mr. Foster; at the latter locality five specimens were beaten from a hedge on the chalk-hills. 4. *Cidaria siderata*, taken at Tring in the larval stage by Mr. A. T. Goodson. 5. *Scoparia angustea*, captured at Watford in 1900 by Mr. V. P. Kitchin. 6. *Aceptilia galactodactyla*, taken at St. Albans by Miss Dickinson. 7. *Tinea granella*, caught at St. Albans by Mr. Gibbs. These seven records brought up the total number of species on the list kept by the Society to 1165. So far as the Rhopalocera were concerned, Mr. Gibbs said he had little to report, most of his correspondents being agreed as to their comparative scarcity, the only exception to this being *Pieris rapæ*, the second brood of which were stated by Miss Dickinson to have been unusually abundant. Mr. Gibbs showed a series of specimens of males of the early brood of this species, taken in his garden at St. Albans, in which the black markings were either very faintly indicated or entirely wanting. The extreme form was known as ab. *immaculata*, and by way of contrast some strongly marked specimens of the second brood were also exhibited. Alluding to the occurrence of *Deilephila livornica* in the British Isles in 1904, Mr. Gibbs said he could not hear of any stragglers having reached Hertfordshire, but he exhibited a specimen taken by Miss Ada Selby in her garden at Bottler's Green in 1898, and mentioned that a second example has since been taken by her at

the same place. The only previous record of which he was aware of the capture of this moth in the county was at Cheshunt, where Mr. W. C. Boyd was fortunate enough to secure one on August 25th, 1868. *Sphinx convolvuli* was several times reported during 1904, and *Chærocampa porcellus* was taken on July 2nd by Mr. Arthur Cottam, of Watford, flying over a honeysuckle-bush. The rapid spread of *Plusia moneta*, which was becoming one of the commonest garden insects in the district, was alluded to, and a long series of specimens reared from larvæ captured on aconite in the recorder's garden at Kitchener's Meads, St. Albans, was shown, a short account of the life-history of the species being given. Among the records of the year was the capture of *Panolis piniperda* near St. Albans, an insect which possessed a special interest for them, as the first British specimen was taken at Hertford in 1810 by Mr. J. F. Stevens, the father of English entomology. Detailed reports of observations made during 1904 by Miss A. Dickinson, of New Farm, near St. Albans; Mr. Arthur Cottam, of Eldercroft, Watford (who is unfortunately leaving the neighbourhood very shortly to reside in Somersetshire); Mr. P. J. Barraud, of Bushey Heath; Mr. V. P. Kitchin, of Watford; Mr. A. T. Goodson, of Tring; Mr. W. C. Boyd, of Waltham Cross; Mr. A. H. Foster, of Hitchin; and the recorder were then presented to the Society. — A. E. GIBBS; Kitchener's Meads, St. Albans.

ERRATUM.—P. 120, line 14 from bottom, for "early in March" read "on February 21st."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 15th, 1905.—Mr. F. Merrifield, President, in the chair.—Señor Don Ignacio Bolivar, of Paseo de Recoletos Bajo, 20, and Calle Jorge Juan, 17, Madrid, was elected an Honorary Fellow of the Society, in the place of Professor F. M. Brauer, deceased. Mr. Frank P. Dodd, of Kuranda, *via* Cairns, Queensland; Mr. Cecil Floersheim, of 16, Kensington Court Mansions, S.W.; Mr. Joseph Lane Hancock, of 3757, Indiana Avenue, Chicago; and Mr. Herbert C. Robinson, Curator of the State Museum, Kuala Lumpur, Selangor, were elected Fellows of the Society.—Mr. C. O. Waterhouse announced that the late Mr. Alexander Fry, a Fellow of the Society, had bequeathed his large and important collections of Coleoptera to the British Museum.—Dr. F. A. Dixey exhibited some butterflies from Natal which had been presented by Mr. G. A. K. Marshall to the Hope Department at Oxford, illustrating certain experiments made with a view to determine whether the assumption of the wet or dry season form of various African butterflies could be controlled by exposure in the pupal state to artificial conditions of temperature and moisture.—Mr. W. E. Sharp, a specimen of the North American Longicorn, *Neoclytus erythrocephalus*. He said the species had been discovered in a sound ash-tree seven inches from the bark, grown in the neighbourhood of St. Helens, Lancashire. Some palings of American ash in the vicinity suggested the origin of the progenitors

of the colony; but it was not known how long they had been erected. He also showed examples of *Amara anthobia*, Villa, with a series of *A. familiaris*, Duf., and *A. lucida* for comparison. They had been sent him by the Rev. G. A. Crawshaw from Leighton Buzzard, where they occurred not infrequently at the roots of grass in sandy places.—Mr. M. Burr, a number of mutilated *Stenobothrus* from the Picos de Europa, Spain. Of the grasshoppers occurring on this spot, almost every specimen had the wings and elytra more or less mutilated, sometimes actually torn to shreds, entirely altering their appearance. A notable exception was *S. bicolor*, of which no single specimen was found mutilated. This species also frequently indulged in flight, which the others were unable to do; and he suggested that its immunity might be due to the vitality which has enabled it to become the most abundant and widespread grasshopper in Europe.—Mr. F. W. Pierce, drawings of the genitalia of Noctuid moths, and also with the lantern a number of slides showing the respective peculiarities of many members of the genus.

April 5th.—Mr. F. Merrifield, President, in the chair.—The decease of Dr. Alpheus S. Packard, an Honorary Fellow, and of Mr. Alfred Beaumont, and M. Alfred Preudhomme de Borre, Fellows of the Society, was announced.—Mr. H. St. J. Donisthorpe exhibited specimens of a melanic *Grammoptera*, discovered by Mr. J. C. T. Poole at Enfield, which appeared to be quite distinct from any member of the genus taken in Britain.—Mr. M. Jacoby brought for exhibition a specimen of *Megalopus melipoma*, Bates, an insect which so much resembles a bee that Bates had said they were indistinguishable in nature.—Mr. A. Bacot exhibited, on behalf of Dr. Culpin, specimens of *Papilio macleayana* and *Hypocysta metirius* captured in Queensland, illustrating the use of "directive" markings in the Rhopalocera in influencing their enemies to attack non-vital parts.—Mr. G. J. Arrow, an example of *Ceratopterus stahli*, Wast., a beetle from Australia possessing notable powers of crepitation.—Mr. A. H. Jones and Mr. H. Rowland-Brown showed a series of *Erebia alecto* (*glacialis*) var. *nicholli*, Obth., taken by them at about 8000 ft., at Campiglio, South Tyrol, with specimens of *Dasydia tenebraria* var. *wockearia*, caught in the company of the *Erebia*s in the same localities. Mr. Jones also exhibited examples of *Erebia melas* from the Parnassus Mountains, Greece, for comparison, and fine forms of butterflies found at Mendel, near Botzen.—Mr. W. J. Kaye exhibited a series of bred *Morpho adonis* from British Guiana, with the very rare dimorphic black-and-white female.—Dr. F. A. Dixey, the social web and pupal shells of *Eucheira socialis*, Westw., together with specimens of the perfect insect, being the actual nest from Mexico described and figured by Westwood in the Transactions for 1836, in connection with which exhibit the Rev. W. T. Holland, of Pittsburgh, U.S.A., gave an account of a social silk cocoon spinning species he had met with also from Mexico.—Professor E. B. Poulton, F.R.S., read a note recently received from Mr. S. A. Neave, giving further interesting evidence of the superstitious dread of larvæ with terrifying eye-like markings entertained by the natives of Rhodesia.—The President read a note on experiments conducted by him to ascertain the vitality of pupæ subjected to submersion.—Mr. H. A. Byatt, B.A., read a paper on "*Pseudacraea poggei* and *Limnas chrysippus*; the Numerical Proportion

of Mimic to Model."—Mr. G. Bethune-Baker contributed "A Monograph on the Genus *Ogyris*."—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 9th*.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Harrison exhibited a living specimen of a large green orthopteron found among bananas imported from Jamaica.—Mr. Main, a box in which a living Javan spider had been kept. A number of ova had been deposited, and a brood of young spiders had emerged. These had spun a dense mass of web, and then shed their skins. He also showed a photograph of the larva of *Apatura iris* in its hibernating position on a leaf of willow.—The remainder of the evening was spent in an exhibition of lantern slides by Messrs. Dennis, Lucas, Tonge, Harrison, and Main.

March 23rd.—The President in the chair. — Mr. H. Moore, a large globe-fish (*Tetrodon lineatus*) from the Red Sea, and contributed notes.—Messrs. Harrison, Main, and Cowham, long bred series of *Colias edusa*, from ova deposited by an example of *helice* sent by Dr. Chapman from South France in 1904. Seventy-nine were males, seventy-one females. Of the latter, nineteen were typical, fifty-two *helice*. Only one or two specimens were in any degree intermediate in shade. Mr. Edwards, *Eupithecia perantia* from Java, *P. gelon* from New Caledonia, *P. encelades* from Celebes, and *P. acanda* from the United States.—Mr. West (Greenwich), some large species of Homoptera and Heteroptera from South Africa.—Mr. Kaye, preserved larvæ of *Triphena interjecta*, and pointed out the distinguishing characters from the larva of *T. orbona*, also exhibited.—Mr. J. W. Tutt gave an address on "Our British Hymenoptera," illustrating his remarks on classification by a philogenetic tree. H. TURNER, *Hon. Rep. Sec.*

ENTOMOLOGICAL CLUB.—A meeting was held on March 21st, 1905, at 48 Kensington Mansions, South Kensington, the residence of Mr. MORRIS St. John K. Donisthorpe, the president and host of the evening. The members present were—Messrs. Adkin, Chitty, Donisthorpe, and Verrall, and there were about a dozen visitors.

RECENT LITERATURE.

WORKS ON MOSQUITOES.

The Mosquitoes or Culicidæ of New York State. By E. P. FELT. Bull. 79. Entom. 22. New York State Museum. Pp. 400+ 37 plates. Albany (1904).

This work deals in a most able and sound scientific manner with the mosquitoes of the State of New York. The plates, taken from drawings of the wings, male genitalia, scales, and larval characters, are most instructive. It forms an almost complete natural history of the New York State species of a high scientific standard. A most interesting part is the appendix, which consists of a "Generic Revision of the State. Only true *Anopheles* occur, but of the

Culicinæ we find *Janthinosoma*, *Psorophora*, *Grabhamia*, *Stegomyia*, *Culex*, *Uranotania*, *Wyeomyia*, and *Aedes* recorded. To these the author adds some new genera split off from the unwieldy genus *Culex*. For *Culex serratus*, Theobald, he proposes the genus *Protoculex*; in another, *Culiseta*, he includes *Culex incidens*; this comes in Neven-Lemaire's genus *Theobaldia*, so some modification must be made for the others he includes, or the genus must sink. *C. dyari*, Coquillett, is taken as the type of a genus *Culicella*; *C. sylvestris*, Theob., the type of *Ecculex*; and Meigen's *cantans* the type of *Culicada*, a most necessary separation. The common North and South American and West Indian *Culex taniorhynchus*, Wied., he places in a genus *Culicelsa*.

The work is so sound and excellent that it should prove one of the greatest advances in recent years. It is unfortunate that the author lays such stress on the male genitalia, as males are often so difficult to obtain.

Report on the Mosquitoes occurring within the State of New Jersey, their Habits, Life-History, &c. By JOHN B. SMITH, Sc.D. Pp. 482+183 figs. and 4 maps. Trenton, New Jersey (1904).

This is a large and valuable work, dealing with mosquitoes generally, and especially with those of New Jersey State. The work is divided into four parts. The first deals with Mosquito Characteristics and Habits; the second, Checks and Remedies; the third, Classification and Descriptions; the fourth, Local Problems and Surveys. The genera dealt with are true *Anopheles*, *Janthinosoma*, *Psorophora*, *Culex*, *Uranotania*, *Wyeomyia*, and *Aedes*. No genera related to *Culex* are given, *Grabhamia* not being employed, nor *Taniorhynchus*.

The illustrations, like the text, are excellent, and there is much valuable matter regarding the destruction of Culicid larvæ.

A Monograph of the Anopheles Mosquitoes of India. By S. P. JAMES, M.B., I.M.S., and W. GLEN LISTON, M.D., I.M.S. Pp. 123+30 plates. Calcutta (1904).

This work deals with most of the known Indian *Anopheles*. It is excellently got up as far as binding and plates go, and has evidently been issued after much painstaking research. The book is divided into two parts. The first deals with "General Matter," the second is "Systematic." Part of the former is excellent, the latter shows a superficial knowledge. The information is not up to date, so the work loses much of its value; for instance, the primitive classification given on page 5 is now considerably altered (*vide* 'Genera Insectorum,' Family Culicidæ). Some pages (19 to 21) are devoted to showing the invalid nature of scale-structure; they need no further notice, as they show such want of knowledge that one is really surprised at reading them.

Chapter II. deals with collecting, mounting, examining, and the identification of *Anopheles* larvæ. The authors give a table for identifying species, partly based on the colour banding of the palpi. This is no more uniform in Indian Anophelinæ than it is in any others,

according to recent examinations. For some reason the authors miss out Walker's *A. vanus*, and in a weird way ignore a distinct genus and marked species (*Aldrichia error*). On page 112 they say: "This genus is based on a single specimen which was found amongst the types of *A. rossii* deposited in the British Museum." We should like to know which therefore they consider *rossii*. Is it *Aldrichia error*, or one of the other five specimens left under *A. rossii*? If *Aldrichia error*, which is not a unique specimen, is only an abnormality of *rossii*, why not place *Stegomyia fasciata* as an abnormality of *Culex pipiens*? There is quite as much similarity. The authors apparently have not seen the types. In a similar vein these investigators state (p. 61): "Another instance of a monstrosity even more marked than the above is the specimen upon which Mr. Theobald has founded a new subfamily called Heptaphlebomyia. The single insect," &c. The authors are evidently quite ignorant of the fact that the single insect is a very common species in Sierra Leone; they are also equally unaware that Ventrillon has described two very marked species of Heptaphlebomyia from Madagascar, and that a third occurs there. They also do not seem to be aware of the fact that types are single specimens. Such matters as these make us at once chary of the whole work.

The authors in a most painstaking manner describe the larvæ, but unless we know the exact stage described such work is of no value. The frontal hairs, as Dr. Graham has found, vary in form in different stages of the same species. Do they or do they not do so in India? Until we have a more sound account of these Indian larval Anophelines we cannot accept the validity of "frontal hair" characters. Let the authors by all means go back for medical purposes to *Anopheles*, *Culex*, and *Aedes*, and let them alter the original descriptions to suit themselves, but it will not do for zoological purposes.

It is regrettable to write this of such a book; but where there is such unsound judgment and such errors it is impossible to look upon it as a whole in any other way.

The coloured plates (fifteen) are beautifully drawn by Dr. D. A. Turkhud, M.B., of which some of the wings are reproduced from the original drawings (given to the British Museum) in error by the artist who illustrated the present writer's monograph without proper acknowledgment in the work.

FRED. V. THEOBALD.

Twenty-eighth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1904. Pp. 56.

This well-known local Society is to be congratulated not only on the considerable progress it has made in the matter of membership, but also as regards the useful nature of the work its members are engaged upon. Not the least valuable of the Society's efforts is the proposed compilation of accurate lists of the insect fauna of the counties which it represents. An important contribution to this series is "A Preliminary List of the Orthoptera," by Mr. E. J. B. Sopp, published in the volume before us. Another interesting paper by this author is on the "Callipers of Earwigs." In an address Mr. Robert Tait (Vice-President) discourses most pleasantly and instructively

on a lepidopterist's work during 1904. The volume contains an excellent portrait of Mr. Samuel J. Capper, F.E.S., the perennial President of the Society.

Entomologen-Adressbuch. Pp. 296. Berlin: W. Junk. 1905.

THIS exceedingly useful Entomologist Directory gives the names and addresses of some 9000 individuals living in various parts of the world who are occupied in the study of Entomology or are interested in collecting insects. Of these about 2000 are credited to Germany, something like 1800 to Great Britain, and rather less than 1000 to France. The number for the United States very slightly exceeds that for our own country.

OBITUARY.

ALPHEUS SPRING PACKARD.

THIS celebrated American entomologist died at Providence, Rhode Island, on February 14th last, having held the position of Professor of Zoology and Geology in Brown University since 1878. He was born at Brunswick, Maine, where his father, who bore the same name as himself, was then a Professor. He graduated there in 1861, and subsequently qualified in medicine, and served as Assistant-Surgeon during 1864 and 1865 in the United States Army; but otherwise he devoted his time wholly to science, and very largely to entomology, where he won for himself a position not unlike that so long filled by Prof. Westwood in Britain; and it is only of his entomological work that we propose to speak here.

Entomologists of the present day do not perhaps know that fifty years ago there was a small penny paper, 'The Entomologist's Weekly Intelligencer,' edited by H. T. Stainton, which ran for ten volumes, and was the immediate ancestor of the 'Entomologists' Monthly Magazine.' The influence of this small forgotten paper on the progress of entomology both in Britain and America was almost incalculable, and in vol. vii., pp. 14, 15 (Oct. 8th, 1859), we find a letter from young Packard, saying that he wished to make a special study of the Geometrinæ, and appealing to British entomologists for assistance. Packard was thus one of the earliest of the great band of entomologists—Scudder, W. H. Edwards, H. Edwards, Grote, Cresson, Osten-Sacken, Walsh, Riley, and others—who have worked during the last half-century till the insects of the United States are more thoroughly and exhaustively studied and known than those of any part of the world, not excepting Britain itself. To this result Packard himself very largely contributed. He was one of the founders of the 'American Naturalist,' which he edited for twenty years. (Part of the information in the present article is taken from the March number of that Journal.) From 1868 to 1872 Packard edited a 'Record of American Entomology,' and his contributions to leading American scientific

periodicals on insects of all orders, Crustacea, Myriopoda, Economic Entomology, Zoology in general, Anatomy, Embryology, Anthropology, Geology, Palæontology, and other allied subjects are extremely numerous. The list of Packard's entomological books and papers fills nearly ten pages of the Library Catalogues of the Entomological Society of London; but among the most important of these are perhaps the following:—'A Monograph of the Geometrid Moths or Phalaenidæ of the United States,' 4to, 1876, thirteen plates; 'Guide to the Study of Insects,' 1869, a thick 8vo volume, profusely illustrated, which has gone through many editions, and did for America what Westwood's 'Modern Classification' did for general entomology; 'Monograph of the Bombycine Moths of America, North of Mexico; Part I. Notodontidæ,' 4to, 1895, with forty-nine plates, mostly beautifully coloured, and maps; and 'Text-book of Entomology, including the Anatomy, Physiology, Embryology, and Metamorphoses of Insects, for use in Agricultural and Technical Schools, as well as by the working Entomologist,' 8vo, 1898. One of his last books was on 'Lamarck, the Founder of Evolution; his Life and Work.'

W. F. K.

A. U. BATTLEY.

It is with the deepest regret that we record the untimely death of Mr. Arthur Unwin Battley, which took place at his residence at Herne Bay, on April 1st, at the early age of thirty-nine. Mr. Battley had been an ardent field-naturalist from his boyhood, and although the Lepidoptera were his favourite study, his acquaintance with ornithology was of no mean order, and botany and geology also claimed a share of his attention. Notes from his pen are scattered in our magazines and transactions of societies, the latest being "On Assembling in *Laticampa quercus*" (Entom. xxxvii. 320), whilst another very interesting contribution was the careful paper, "Notes on the Life-history of *Iporia cratagi*" (*ibid.* xxxvi. 249). Thoroughly practical in everything in which he interested himself, he was always ready to impart information and advice whenever it was within his power; and his geniality and unselfishness endeared him to a wide circle of acquaintances. Perhaps some of his best work was in the promotion of nature study through his encouragement of the smaller societies, and especially his interest in, and help to the young beginners. He was a Secretary of the City of London Entomological and Natural History Society from 1890 to 1895, President of the North London Natural History Society in 1893, and a valued member of that society up to the time of his death. During his residence at Hanwell and at Herne Bay he was associated with the Ealing Natural Science Society and the East Kent Natural History Society respectively; and only just before his death he had organized a new "Herne Bay and District Field Club," of which he was to act as Hon. Secretary and Treasurer. His loss will be keenly felt by many who had come under the magnetic influence of his enthusiasm, or who were indebted to his unvarying kindness.

THE ENTOMOLOGIST

VOL. XXXVIII.]

JUNE, 1905

[No. 505.]

NEW AND LITTLE-KNOWN AMERICAN BEES.

By T. D. A. COCKERELL.

PERDITA MENTZELIARUM, Ckll., var. *LAUTA*, n. var.

♀. Anterior and middle femora without dark markings, or slightly marked with black or blackish in front; abdomen creamy-white, with the bands much reduced, usually represented by two pairs of lateral or sublateral spots on the first segment, and one pair each near the hind margins of the second and third; lateral face-marks usually pointed above.

♂. Head very large; cheeks with a short spine; yellow going above level of antennæ in median line, the process blunt.

Hab. Collected by Professor E. O. Wooton "on *Mentzelia* (*wrightii* or *multiflora*), five or six miles above Tularosa, New Mexico, on road to mountains, end of August"; seven females, two males. Flying with them, over the same flowers, were *P. mentzeliarum*, Ckll., two females; *P. mentzeliae*, Ckll., one male, one female; and several *P. wootonæ*, Ckll.

The *mentzelia* (i. e. *Toutereia*) species of *Perdita* are very variable. At Raton, N. M., Aug. 29th, I took a variety of *P. mentzeliae*, much larger in both sexes than that found near Tularosa, the male having a very large head, like the *pulchrior* form of *P. pallidior*. At flowers of *Toutereia multiflora*, at La Cueva, Organ Mts., Sept. 2nd, Prof. C. H. T. Townsend took a male *P. mentzeliarum*, in which the abdomen is orange, wholly without bands or spots, except an arched dark band on the first segment.

MELISSODES AGILIS, Cresson, var. *SUBAGILIS*, n. var.

♂. Length about $8\frac{1}{2}$ mm.; labrum entirely black, mandibles without a yellow spot; third submarginal cell less narrowed above; eyes (when dry) light green.

Hab. Fort Collins, Colorado, Aug. 21st, 1903. (Colorado Agricultural College.)

By the black labrum and spotless mandibles this agrees with the Mexican *M. floris*, Ckll.; it differs from *floris* by the rufous

edge of the clypeus, absence of black hairs on thorax, and generally lighter colour. The type specimen was taken at flowers of *Grindelia squarrosa* by Mr. F. C. Bishopp.

MELISSODES MYSOPS, n. sp.

♂. Length nearly 14 mm., pubescence dull white, some black on scutellum, and black on the basal parts of the abdominal segments except the first; clypeus lemon-yellow, its upper margin black; labrum black; mandibles without a yellow spot; flagellum red beneath. Very close to *M. cnici*, Rob., from which it differs thus: yellow of clypeus only obscurely trilobed; face broader; eyes (when dry) pale bluish-grey; antennæ darker; ventral hair of thorax not black; scutellum with black hair in middle; hair of legs not black; disc of mesothorax and scutellum more shining, the punctures more separated; abdomen narrower and longer, with weak light hair-bands, failing in the middle; lateral subapical teeth longer and narrower.

♀. Length about 14 mm.; face broad, facial quadrangle much broader than long; eyes light grey; flagellum stained with red beneath; hind part of mesothorax, and scutellum, shining, with well-separated punctures, and sparsely clothed with erect black hair; pubescence of legs black, but scopa on outer side of hind tibiae and base of tarsi long, strongly plumose, and light reddish, in striking contrast; hair on under side of abdomen and lower part of pleura black, that at apex of abdomen dark fuscous or black. Differs from *M. cnici*, Rob., by the conspicuous black hair on disc of thorax, the more shining and less closely and coarsely punctured scutellum, and the narrower abdomen, with distinct pale hair-bands, especially on the third and fourth segments.

Hab. Maybell, Colorado (type locality), Aug. 1st, 1904, both sexes; Virginia Dale, Colorado, Aug. 2nd, 1903, two females. *M. cnici* is an oligotropic visitor of thistles; the pollen collected by the present species at Maybell looks like thistle-pollen. My *M. cnici*, used for comparison, are Nebraska specimens received from Mr. J. C. Crawford. In dry specimens the eyes of *M. mysops* are light grey in both sexes; in *M. cnici* they are light reddish; in *M. dentiventris* (female) they are light green.

Since writing the above I have ascertained that the Maybell material was collected by Mr. S. A. Johnson at flowers of thistle, while the Virginia Dale specimens were collected by Mr. F. C. Bishopp at flowers of white thistle.

SYNHALONIA TERRITELLA, n. sp.

♂. Length slightly less than 10 mm.; black, the head, thorax, base of abdomen, and legs with abundant long erect greyish-white hair, not at all fulvous, even on mesothorax; eyes (dry) dark plumbeous; facial quadrangle about square; clypeus lemon-yellow, without any black border above, but with the usual narrow brown anterior edge; antennæ long, entirely black, third joint comparatively long, considerably over twice length of second; labrum light yellow, with the lateral margins black; mandibles black; last joint of maxillary

palpi long, apparently a little longer than the fifth, fourth and fifth together about as long as third; tegulae dark; wings clear; abdomen subglobose, black, the erect white hair covering first segment and basal two-thirds of second, the apical third of second covered with black hair; third and fourth segments with short black hair, and no pale hair-bands; fifth with a subapical band of very thin light hair; sixth with a more pronounced band or fringe; last ventral segment with the lateral margins elevated; legs normal, hair on inner side of basal joint of tarsi orange.

Hab. Palisade, Colorado, May 7th, 1901, two males. (Colorado Agricultural College.)

Similar in many respects to *S. edwardsii*, but smaller, with the third antennal joint longer, the yellow of the clypeus paler, &c. The type specimen was taken by Prof. C. P. Gillette at flowers of plum.

SYNHALONIA TRUTTÆ, n. sp.

Synhalonia frater (not of Cresson), Ckll., Amer. Naturalist, vol. 36, p. 815 (no description).

♂. Length about 12 mm.; black, the head, thorax, base of abdomen and legs with abundant long erect greyish-white hair, not at all fulvous, even on mesothorax; eyes (dry) reddish-black; facial quadrangle broader than long; clypeus very bright lemon-yellow, the upper border narrowly black, this black broadening before it ends laterally; narrow anterior margin very pale brownish; labrum retracted in the specimen described; mandibles black; last joint of maxillary palpi at least as long as the fifth; antennae long, entirely black, third joint of moderate length; wings slightly dusky; abdomen quite without light hair-bands; first two segments with erect light hair, but extreme apical margin of first, and base and apex of second, with black hair; last ventral segment with no distinct lateral elevations; legs normal; pectinigerous spur on anterior tibia ending in two long slender spines, one of which terminates the comb, while the other is prolonged in the line of the spur; hind spurs normal. Although the abdomen is without hair-bands, properly speaking, the sides of the third and fourth segments, viewed laterally (obliquely) show glittering white hairs. This is extremely like the male of *S. edwardsii*, but the pubescence is paler, and the second abdominal segment has it black at base; the scape also is considerably less swollen.

♀. Differs from that of *S. frater* by its rather smaller size; reduced abdominal hair-bands, those on the third and fourth segments being narrow and more or less broken in the middle line; apical plate much more rounded, less conical in outline; hind spur of hind tibia long and straight, not curved at the tip; mandibles without a light streak. The reduced abdominal bands, the shape of the apical plate, and the long straight hind spur, also distinguish it from *S. belfragei*. The ventral abdominal segments are fringed with pale hair, greyish-white at the sides, more or less fulvous in the middle. The second dorsal abdominal segment has a complete transverse area covered with light hair to the exclusion of the black, which is before and behind it, but this light hair is thin and erect, so that it does not seem to form

a band when the insect is seen from above, as it does in *frater* and *belfragei*; this area of light hair is gently concave behind, and is considerably narrowed laterally.

Hab. Trout Spring, Gallinas Cañon, New Mexico, May 24th (Cockerell). It visits the flowers of *Iris missouriensis*. Evidently the New Mexico representative of *S. edwardsii*, Cresson.

SYNHALONIA SPECIOSA (Cresson).

♂. Length about 14 mm.; black, with dull white pubescence, tinged with ochreous on thorax above; facial quadrangle longer than broad; clypeus bright lemon-yellow, the yellow notched deeply on each side above; labrum pale yellow; mandibles black, with the apical part reddish, and furnished below with a number of shining red hairs; maxillary palpi 6-jointed, the second and third joints long and about equal, the last three together about as long as the third, and successively smaller, the last being narrow and minute; antennæ reaching to base of abdomen, entirely black, apical part of flagellum crenulated, and obscurely longitudinally ridged above; scape short and broad; third joint about one-third length of fourth; mesothorax and scutellum with very close shallow punctures; tegulæ dark anteriorly, pallid and subhyaline posteriorly; wings tinged with brown, the nervures piceous; abdomen with black hair mixed with the pale on the basal parts of segments three to six; apex of second segment with coarse black hair; third to sixth segments with apical or subapical bands of white tomentum (such as are seen in females of *Synhalonia*), these bands successively stronger on each segment going backwards; apical plate black, broadly truncate, very little narrowed posteriorly; last ventral segment with a short square tooth or process on each extreme lateral margin; legs black, the tarsi ferruginous, the basal joints black or blackish on the outer side, the hair on inner side of basal joints orange-ferruginous; middle tarsi slender but normal, first joint with no apical process; both spurs of hind tibiæ hooked apically; basal joint of hind tarsus with a couple of red curved bristles at apex, simulating a curved spine.

Hab. Fort Collins, Colorado, May 29th, 1901, and May 28th, 1901 (Colorado Agricultural College); Boulder, Colorado, May 17th, 1902 (S. A. Johnson, 496).

Allied to *S. gillettei*, Ckll., but easily distinguished by the smaller size, hooked spurs, &c. The May 29th example is recorded as from mountain ash, taken by Mr. Titus. I had described this as a new species, but having some misgivings lest the remarkable character of the hind spur might have been overlooked in the description of one of Cresson's, I asked Mr. Viereck to examine Cresson's types with this question in mind. He has very kindly done so, and reports that in *S. frater*, *dilecta*, *lepida*, and all the other species of *Synhalonia* in the collection at Philadelphia the spurs are simple; except in the male of *S. speciosa* as determined by Robertson, who has taken the sexes *in coitu*. In this male *speciosa* the spurs and the peculiarities of the hind tarsi are just as described above, and it is evident that the species

is the same. It had not occurred to me to refer the insect to *speciosa*, because the only description of that species given by Cresson is that of a female, and Robertson had published the opinion that it is a synonym of *frater*. It is now evident that *frater* can readily be distinguished from *speciosa* in the male by the character of its spurs.

Boulder, Colorado: March 6th, 1905.

STRAY NOTES ON ACULEATES.

BY PERCY E. FREKE, F.E.S.

I HAVE always found *Vespa vulgaris* more numerous than other wasps. In some places *V. germanica* seems to be as abundant or, indeed, more so, but this is, I believe, more apparent than real, the latter coming much more into houses and shops in search of sweets. At Tramore, Co. Waterford, it seemed to be almost the only wasp in the town, but on examining the country hedgerows, I found *V. vulgaris* maintained its numerical superiority. *V. germanica* might well be called the "house-wasp," or the "town-wasp," and *V. vulgaris* the "country-wasp." At Borris, Co. Carlow, I examined many nests, and found that *V. vulgaris* was responsible for 81.5 per cent. of them, *V. germanica* coming next, but a long way behind. There *V. rufa* and *V. sylvestris* are about equally common, probably rather less so than *V. germanica*, whereas about Dublin *V. rufa* is rare, and *V. sylvestris* and *V. norvegica* (the last the least common at Borris), are about equal, and *V. germanica* is about half as common as *vulgaris*. In one place one seems more numerous, whereas in another place the reverse is the case, but always *vulgaris* holds the lead more or less. Why is this? I believe because it is the most "hardy" of our wasps. I have noticed it flying in some numbers quite late in the season, when others of its genus had ceased to appear weeks before, and I think it probable that this character enables a larger proportion of females to survive the winter. I believe *vulgaris* has also a larger family. Certain it is that the males of this species are more commonly seen on the wing in autumn than *germanica* even in the latter's most favoured districts.

With regard to the face-markings, I have found the females and workers of *germanica* to vary more than *vulgaris*, and I believe variation is by nests, and not individually. I examined a nest of rather abnormally marked *germanica*, and found 80 per cent. of the workers were thus marked. In the normally marked nests I found no abnormally marked individuals.

Generally, wasps are very good-tempered, unless the nest

itself is actually attacked, or they have been irritated by former attacks upon their home. I have often stood in front of the nest and captured numbers of the inmates as they came or went, without the others interfering. I have never know a wasp make a totally unprovoked attack. Hive-bees constantly do so, and are far worse tempered than wasps. A wasp, on coming into a room, shows far more sagacity than a hive-bee about getting out again. The latter seems to lose its head completely and, being frightened, gets very cross. But a wasp may lose its temper, even when its safety is not threatened. I saw one of them feeding on fallen apples, in company with some large flies. One of the flies carelessly jostled the wasp, who turned savagely upon it and bit off one of its wings and then left it and returned to the apple.

I think *V. sylvestris* is perhaps our most savage wasp, and *V. norvegica* the least so. Indeed, when a boy, I have, with the help of one of the grooms, cut away a nest of *norvegica*, and carried it home half a mile, defending ourselves with pieces of brushwood, and have not received a single sting. We ran all the way home, and any wasps that were in the nest when we started, came out, but did not attack us.

Wasps are very gentle towards individuals of their own species. I have seen them, having fallen into the gardener's bottle of sugar and water, and have noticed that when one tried to save itself by climbing on to its neighbour, the latter would turn on it with open jaws, yet if it were one of its own species (possibly its own nest), it was never attacked. Not so, however, if one of them were *vulgaris* and the other *germanica*. Then they closed in mortal combat, and I have often seen them lying drowned, locked in each other's grasp.

When a wasp attacks a large fly, it attempts to disable it by biting through the principal nervures of one wing. This is not as easy as one might suppose, and I have often seen the contest last a considerable time. I once saw a wasp attack a large fly (*Sarcophaga carnaria*), and it seemed incapable of disabling it thus. The fly dragged it about over the ground for some time, until at last the wasp, despairing of success in the usual way, shifted its grasp forward, and seized the fly by the neck and bit its head off at once. Why is not this the usual mode of attack? It seemed so much easier than the other. Probably it offers more chance for the victim to slip from its antagonist's grasp before she can seize the neck.

Generally, a wasp bites its captive almost into a shapeless mass, and then carries it home to its nest. I saw one attempt to fly across a river with an unusually heavy burden of that kind. It started from a high bank, but was not equal to the task, and got lower and lower, until, just as they touched the water, a big trout rose and sucked them both down.

The males of some of the Aculeates are very quarrelsome. I have seen a pair of *Pompilus gibbus* fight furiously for the possession of a female which was present, and, on examining them, have found that they had both suffered severely; indeed, the smaller of the two had no wings left, only the remnants of nervures.

I have seen the males of *Mellinus arvensis*, when cruising up and down in front of the burrows of their females, seize each other and, fighting fiercely, roll down the bank together. The most combative of our Aculeates is, I think, *Andrena wilkella*. I have often seen the males fight with each other in a most determined manner. But they do not confine their quarrels to those of their own race. I once saw a large female of *Bombus terrestris* struggling on the ground, buzzing, and trying to get away from something that held her. I found a male of *A. wilkella* had seized her by the hind leg, and refused to let go, until I captured them both. She was able to crawl about, but could not fly away with her antagonist holding on, and did not appear to offer any resistance. I put the angry *Andrena* into a bottle which already contained a worker of *Vespa vulgaris*, thinking he would soon have the tables turned on him, but he unhesitatingly attacked the wasp, which, to my surprise, seemed quite afraid of him, and disposed to keep out of his way, and he renewed the attack every time the wasp came near him, and drove it off. I cannot help thinking that this wasp was timid from finding himself in the bottle, but that does not detract from the valour displayed by the little *Andrena*.

The males of *Bombus* sometimes quarrel among themselves, and I have seen those of *B. lapidarius* fighting on the ground, and tumbling over each other like two dogs, although I could not see any female in the neighbourhood. Also when they are presumably seeking the females, they often fly up and down a hedge on a hot day, and will attack any one who passes near them. In this way I have been persistently attacked by males of *B. agrorum* and *B. terrestris*, the latter even striking my hat as they dashed at me.

I saw a fierce battle near Cæsar's camp at Folkestone, between four large females of *B. lapidarius*. Three of them were on the ground when I first saw them, and the fourth came to join in the fight while I was looking on. At first I thought they must be males fighting for a female, but this was certainly not the case. Then I thought perhaps it was a contest between *Bombus* and *Psithyrus*, but they were undoubtedly all *B. lapidarius*. This is contrary to all my former experience. Generally, the females of the social Hymenoptera are rather gentle outside their nest. But these were fighting on the open ground, on the grass.

I once watched a bank where many small solitary bees had

their nests in a colony. The parasitic *Nomada alternata* were busy examining their burrows. They appeared extremely careful, stopping at the mouth of the holes, with their antennae directed forward, and carefully watching for any symptom from within of the presence of the rightful owner. I saw the head of an *Andrena* at one burrow, and it was presently withdrawn. Very soon *Nomada* came and inspected the hole, but promptly departed. However, in the case of one returning, *A. trimmerana*, I thought the intruder had been caught inside. There was a terrible scuffle at the mouth of the hole. It lasted just two minutes, which appeared a long time as I watched it. *Andrena* pulling with all her might, and something within which as steadily resisted. At last, suddenly, out came something which she thrust backwards beneath her between her legs, and which rolled to the bottom of the bank, while she entered the burrow triumphantly. I picked up the vanquished insect, which seemed to be very seedy, and was surprised to find it was not a *Nomada*, but a female *Halictus rubicundus*.

I have watched females of *Mellinus arvensis* catching flies on cow-dung. *Mellinus* ran about until it saw a fly, advanced to within from two to three inches of it, paused for an instant, like a dog pointing, as if it were taking aim, and then sprang forward, rarely more than about two inches. The fly was often missed, but, if caught, they both rolled over, *Mellinus* biting its prey. I noticed it did not attack every species. The little flies, *Sepsis cynipsea*, it passed by contemptuously. *Lucilia cornicina* it often passed unnoticed, though I saw it attempt to catch several, only in one case successfully, and then the fly was released immediately, seemingly none the worse, *Mellinus* running off apparently disgusted at having made a mistake. *Musca* was greedily seized. I did not see any "blue-bottles," which I know are a favourite prey, but there was present a specimen of *Mesembrina meridiana* which *Mellinus* avoided, giving it a wide berth, and I frequently saw this big fly chase it for a few inches from one place to another. I do not know why this should be, for I have often seen *Mellinus* carry off blue-bottles just, or nearly, as large, and I have seen wasps attack this fly readily.

Sometimes the tables are turned, and I have seen a little *Andrena minutula*, when busily engaged rifling a dandelion-head, pounced on by one of the bloodthirsty red "cow-dung flies." The little bee was taken unfairly at a disadvantage, as it was seized from above, and a desperate struggle ensued, until *Andrena* reversed herself, when the fly decamped with most ludicrous promptitude.

Southpoint, Limes Road, Folkestone.

DESCRIPTIONS OF TWO NEW ACULEATE HYMENOPTERA FROM THE TRANSVAAL.

By P. CAMERON.

TACHYTES TRANSVAALENSIS, sp. nov.

Black, the apical two joints of the four front tarsi reddish; the tibial and tarsal spines pale testaceous; the calcaria testaceous; head and thorax densely covered with grey hair; the apices of the abdominal segments with broad bands of silvery pile; the pygidium covered with fulvous, mixed with silvery pubescence. Wings clear hyaline, highly iridescent, the costa, stigma, and nervures pale testaceous; the second abscissa of radius shorter than the third; the second recurrent nervure is received in the middle of the cellule; the apex of radius is rounded below, obliquely sloped; the first transverse cubital nervure is roundly curved backwards to the cubitus. Eyes distinctly converging above, where they are separated by the length of the antennal scape and pedicle. Apical half of mandibles pallid testaceous, the base thickly covered with silvery pubescence. Base of fore tarsi with six spines. Pygidium clearly longer than it is wide at the base, gradually narrowed towards the apex, as in *T. mira*, Kohl (cf. Ann. Hof. Mus. Wien, 1894, pl. xiii. f. 32). The second joint of the flagellum is three times longer than its thickness in the middle. The furrow on the base of the metanotum is irregularly transversely striated; it is indistinct; on top of the apical slope is a closely, distinctly, transversely striated space; the apical slope is transversely rugose. The long spur of the hind tibiae is as long as the metatarsus. ♀. Length, 14 mm.

Transvaal.

Palpi dark testaceous. The pubescence on the hind tibiae behind has a golden tinge. On either side of the clypeus are three stumpy, not very clearly defined, teeth or ridges. The pubescence on the pygidium is close, short, and depressed. The second abscissa of the radius is shorter than the space bounded by the recurrent nervures.

It is possible that this may be *T. hirsutus*, Sm. (Cat. Hym. Ins. Brit. Mus. iii. p. 300), of which only the male has been described; but the description is not sufficiently precise to enable me to decide this without an examination of the type; the pubescence of the head and thorax is certainly different, it being yellow and "rich golden" on the face.

ODYNERUS VAALENSIS, sp. nov.

Black; the scape below, clypeus, labrum, a mark wider than long, transverse above, roundly narrowed below and slightly incised in the middle, a band, narrowed in the middle, on the first abdominal segment above, a broader one, irregular behind and slightly incised in the middle there, on the second above and below—the under line trilobate—and the apices of the other segments, yellow. Legs bright fulvous red, the coxae and trochanters black. Wings almost hyaline, the radial and cubital cellules smoky violaceous; tegulae rufous. ♂. Length, 8 mm.

Vertex rugosely punctured, the front closely longitudinally reticulated-striated. Clypeus as long as it is broad, rounded broadly above, the apex with an incision on its apex, where it is wider than its greatest length; it becomes gradually wider towards the apex, the sides being sharply pointed. Apices of mandibles rufous. Temples reticulated-punctured closely. Apex of pronotum transverse, the lateral angles not acute. Pro- and mesopleuræ more coarsely rugose than the mesonotum; the metapleuræ, except near the base above, closely striated obliquely, the striæ intermixing and forming almost reticulations in places. Lateral angles of metanotum forming, with the base, almost a triangle, i.e. the sides are produced into a blunt point in the middle. Scutellum quadrangular, broader than long, its base obliquely sloped. Apex of post-scutellum smooth, obliquely sloped. Centre of metanotum hollowed, smooth; the keel in the centre widened towards the apex. Basal abdominal segment cup-shaped; the second slightly longer than the width at the apex, which is smooth and turned up. The flagellum of antennæ is brownish beneath; the hook is brown, stout, reaching to the apex of the joint. There are two lines on the post-scutellum.

Comes near to *O. posticus* and *O. silvaensis*. The former I do not know in nature, but the latter may be separated from my species as follows:—

Apical segments of abdomen and basal half of antennæ	red, a yellow line in the eye-incision, the sides of the	
	median segment not dilated in the middle (some-	
	times yellow)	<i>silvaensis</i> , Sauss.
Apical segments of abdomen and antennæ not red, no	yellow line on the eye-incision, the sides of median	
	segment dilated in the middle	<i>vaalensis</i> , sp. nov.

The specimens of *silvaensis* which I have seen (there is a specimen from the Transvaal in the Albany Museum, Grahamstown) is Saussure's variety, they having the post-scutellum and sides of metanotum yellow. The tibiæ, too, are yellow on the outer side (cf. Saussure, 'Vespides,' i. p. 214).

NEW CULICIDÆ FROM THE WEST COAST OF AFRICA.

By FRED. V. THEOBALD, M.A.

(Concluded from p. 104.)

Genus *ÆDIMORPHUS*, Theobald.

(Mono. Culicid. iii. p. 290, 1903; Genera Insectorum, Culic. p. 20, 1904.)

ÆDIMORPHUS ALBOANNULATUS, n. sp.

Head dark brown; proboscis black, with a white band on the apical half. Thorax deep rich brown, with scanty golden scales; a silvery white spot on each prothoracic lobe; pleuræ pale brown, with

silvery white puncta; scutellum silvery white. Abdomen deep brown, unbanded, with basal white lateral spots. Legs deep brown, with apical silvery white bands, most pronounced in the hind legs, the last hind tarsal being all white.

♀. Head deep brown, clothed with dusky flat scales over most of the surface, and some flat creamy ones at the sides; around the eyes rather large golden narrow-curved scales, and smaller and duller ones at the back; over the whole surface very long deep black upright forked scales. Proboscis black, with a pale ochreous band slightly towards the apical half. Palpi deep brown and densely scaly; clypeus brown. Thorax rich deep chestnut-brown, with scattered small golden curved scales; silvery white flat scales on the prothoracic lobes; numerous black bristles over the roots of the wings; scutellum brown, clothed with silvery white flat scales and black border-bristles, six to the mid lobe and some smaller ones with them; pleuræ brown, with prominent silvery white puncta composed of flat scales; one large spot of these scales seems to project outwards, and can be seen when the insect is viewed from above, looking almost like a silvery spot close to the roots of the wings. Abdomen deep brown, with basal white lateral spots and pale venter. Legs black, with apical silvery white bands as follows: small but prominent on the femora and tibiæ of all the legs, on all the metatarsi, and on the fore and mid first tarsal segment; in the hind legs prominent on all the segments, the last tarsal being pure white. All the ungues equal and unserrated. Wings with the first submarginal a little longer and narrower than the second posterior cell, its base nearly level with that of the second posterior, stem of the first submarginal cell about two-thirds the length of the cell, stem of the second posterior cell as long as the cell; posterior cross-vein nearly twice its own length distant from the mid. Halteres with pale stem and fuscous and white knot. The scales are dark brown, especially along the costa, with deep violet reflections towards the base, and a white patch of scales at the base of the costa and first long vein. Length, 4.5 mm.

♂. Palpi about the same length as the banded proboscis, the two apical segments small and about equal, a pale band at the base of the apical segment; on both apical segments, and on the apex of the antepenultimate, a few long brown hairs. Fore and mid ungues unequal, the mid more so than the front ones, both unserrated, the tooth of the larger mid unguis near the base and small. Length, 4 to 4.5 mm.

Habitat. Sierra Leone, West Africa.

Observations.—Described from two specimens (a male and female) in perfect condition. It is a very marked species, the general ornamentation of the thorax and legs being characteristic. I cannot be certain as to the exact structure of the male ungues, as there is only one specimen, nor the genitalia, which are hidden in hairs and scales. No notes were sent with the specimens.

Genus *CULEX*, Linnæus.

(Syst. Nat. 1738, Linnæus; Mono. Culicid. i. p. 326, 1901, Theobald.)

CULEX HIRSUTIPALPIS, Theobald.

(Mono. Culicid. i. p. 378, 1901.)

Several males and females from Bihé, Angola. The males differ from the type in that there is no pale band at the apex of the palpi.

My figure of the male unguis (Mono. Culicid. i. p. 378) were drawn from a pinned specimen in which they could not clearly be seen. When mounted and examined flat the tooth of the larger fore and mid unguis is seen to be large and outstanding, almost at right angles to the claw, and the tooth of the smaller one is more pronounced and nearer the base. The series also shows great variation in size, some specimens being one-third less than the type.

Genus *HEPTAPHLEBOMYIA*, Theobald.*

(Mono. Culicid. iii. p. 336, 1903.)

This genus was described from a single female. The fresh material sent from Angola by Dr. Creighton Wellman has enabled me to add fresh generic characters to those already given. The males sent by the collector do not agree with the females, and I am not sure if they are of the same species.

Characters of the Genus.—Head clothed with narrow-curved scales, and upright forked ones, except at the sides, where they are small and spathulate. Palpi of the female small but prominent, in the male acuminate, the last two segments hairy. Thorax clothed with narrow-curved scales, and also the scutellum and prothoracic lobes; the pleuræ in the female with patches of flat scales, which end in a sharp point; in the male they are rounded apically. The wings have the typical *Culex* venation, but the females have a distinct seventh long vein, scaled for part of its length with rather large elongated flat scales, which apparently vary in number from ten to fifteen. The scales of the wing are rather broader than in *Culex*, especially in the apices of the veins, including the branches of the fork-cells. In the males there does not seem to be a scaled seventh vein, but the sixth is markedly bent at right angles near the edge of the wing.

The two chief features in the genus are the presence of a scaled seventh vein in the female, and the peculiar form of the scales on the pleuræ, which I have not seen in any other Culicids. There is a superficial resemblance between the males and females, but the absence of the scaled seventh vein in the males makes it doubtful if they really belong here, although evidently they were taken together by the collector.

* Since this was sent to press, two very marked new species have been sent me from Madagascar. The descriptions will shortly appear in the 'Archiv der Parasitologie,' in a paper on Madagascan Culicidæ by M. Veutillon.

HEPTAPHLEBOMYIA SIMPLEX, Theobald.

Head deep brown, with greyish scales; palpi of female thin, black, and white-scaled, of male thin, black; proboscis black, unbanded. Thorax deep brown, with small reddish golden narrow-curved scales, brown pleuræ with snowy white puncta. Abdomen deep brown, with basal white curved bands, and basal white lateral spots. Legs deep brown, unbanded; white femoral and tibial apical spots and traces of a very fine indistinct white line on femora and tibiæ. Ungues of female small, equal, and simple.

♀. Head deep brown, with narrow-curved grey scales, somewhat largest in the middle of the head, and black upright forked scales; small white flat lateral scales and a row of rather long and prominent deep brown bristles projecting from the front of the head, those of each side pointing inwards; clypeus and proboscis deep black; palpi thin, rather irregular in form, and clothed with black and white scales. Thorax deep brown, clothed with narrow-curved reddish golden scales, some grey ones in front near the head, another small patch in front of the roots of the wings, pale ones over the roots and before the scutellum; scutellum with pale dull creamy narrow-curved scales, with two series of border-bristles, the larger deep brown, the smaller pale golden; prothoracic lobes with narrow-curved pale scales, and some brown chætæ; pleuræ deep brown, with patches of flat-pointed white scales and short golden bristles here and there. Abdomen deep orange-yellow, clothed with deep blackish brown scales with violet reflections, and with basal white curved bands, those of the second, third, and fourth segments being in the form of almost median curved spots; all the segments with basal white lateral spots; border-bristles small and pallid, many pallid hairs at the sides of the body; venter mostly white, scaled with black. Legs deep black, the apices of the femora and tibiæ with a white spot; also on the femora and tibiæ is a rather indistinct ventral white line; unguis small, equal, and simple. Wings with the first submarginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem varying from one-third to one-half the length of the cell; stem of the second posterior about two-thirds the length of the cell; the posterior cross-vein from one and a half to twice its own length distant from the mid; the seventh vein with scales which vary in number from ten to about fifteen. Length, 3.5 to 4 mm.

♂. Head clothed with narrow-curved pale scales, a more or less prominent median bare line; clypeus and proboscis deep brown; antennæ grey, with deep brown bands and verticillate hairs. Palpi deep brown, the apical segment acuminate, last two segments hairy, the antepenultimate segment thin and weak, with a trace of a pale band upon it, hairs black; two apical segments equal. Thorax very similar to the female, but does not show the pale scales. Abdomen banded as in the female, narrow, with rather scanty long pale brown hairs; the apical segment with scattered creamy scales, the penultimate with the pale basal band extending down each side of the segment. Fore and mid unguis unequal, both uniserrated, hind equal, simple, and small. Wings with the seventh vein apparently not scaled (*i. e.* only a fold and no true vein). The first submarginal cell consider-

ably longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior cell, its stem about half the length of the cell; stem of the second posterior cell not as long as the cell; posterior cross-vein nearly twice its own length distant from the mid; sixth vein curved almost at right angles at the apex. The male genitalia have rather a narrow basal lobe, with a long curved lateral process composed of several narrow laminae, and nearer the clasper another process, shorter, and composed of finer parts; the clasper terminates in a small jointed process. Length, 3.5 to 4 mm.

Habitat. Bihé, Angola, Portuguese West Africa (Dr. Creighton Wellman).

Observations.—The four females sent by Dr. Creighton Wellman all show the marked seventh scaled vein, but the males do not. There is variation in size, showing, as usual, that exact measurements of Culicids are of no diagnostic value. This species might easily be mistaken at first for *Culex fatigans*, Wied., and, on more careful examination, to be near *C. creticus*, Theob., owing to the white scaled line on the femora and tibiae; but a microscopic, or even a careful hand-lens, examination will at once reveal the seventh scaled vein.

The original type is in the British Museum, and all the specimens redescribed here. There were three males sent with the females.

Further notes on this genus will shortly be issued in the 'Archiv der Parasitologie' on important material collected and described by M. Veutillon.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

(Continued from p. 135.)

Triphena ianthina.—Generally distributed throughout the district; comes to sugared ragwort flowers in July and August.

T. interjecta.—Uncommon. I have only taken examples near Heysham, Hest Bank, and in the County Asylum grounds in July.

T. comes (orbona).—Comes freely to sugar in July and August, and is generally distributed. This species is very variable.

T. pronuba.—Abundant at sugar in July and August everywhere. This is another very variable species in colour—from silver-grey to black-brown.

Amphipyra tragopogonis.—Fairly common everywhere at sugar in August.

Mania maua.—Comes to sugar in Aqueduct Wood and other localities on the banks of the Lune at the end of July. I have also taken specimens in the County Asylum grounds.

Panolis piniperda.—Not common; comes to sallow-bloom in April: Corporation Wood, Quernmore, County Asylum grounds, near Clougha, Blea Tarn, &c.

Pachnobia rubricosa.—Fairly common at sallow-bloom, and generally distributed throughout the district.

Taniocampa gothica.—Common at sallow-bloom in March and April, everywhere. This species shows considerable variation. The var. *gothicina* is scarce.

T. incerta (instabilis).—Common everywhere at sallow-bloom in March and April.

T. populeti.—Not common; comes to sallow-bloom in March and April, near Clougha, the County Asylum grounds, Quernmore, Halton, &c.

T. stabilis.—Plentiful everywhere at sallow-bloom in March and April. This species shows considerable variation of ground colour.

T. pulverulenta.—Generally distributed and fairly common. Comes to sallow-bloom in March and April.

Dyschorista (Orthosia) suspecta.—I have only taken this species near Clougha at sugar in July.

Orthosia lota.—Fairly common at sugar, and generally distributed, in September.

O. macilentata.—Fairly common at sugar in September; Halton, Grimshaw Lane, County Asylum grounds, Blea Tarn, Freeman's Wood, &c.

O. helvola (rufina).—Fairly common at sugar in September and October; County Asylum grounds, Grimshaw Lane, Halton, Aqueduct Wood, &c. This species varies considerably.

O. pistacina.—I have bred this species from Witherslack and Methop larvæ, and have taken it at sugar in the County Asylum grounds in September and October, but it is not plentiful.

O. litura.—Common at sugar in September; Witherslack, Methop, County Asylum grounds, Blea Tarn, Freeman's Wood, Corporation Wood, &c.

O. circumscripta (ferruginea).—Abundant at sugar in late September and October in the County Asylum grounds, Grimshaw Lane, Aqueduct Wood, Corporation Wood, &c.

Orrhodia vaccinii.—Abundant everywhere at sugar and ivy-bloom in September, October, and November.

O. ligula (spadicea).—Abundant everywhere at sugar and ivy-bloom in September, October, and November.

Scopelosoma satellitia.—Fairly common at sugar in September and October. This species varies much in ground colour—from red to dark dull brown, and with a white, red, or yellow reniform.

Xanthia fulvago (cerago).—Fairly common and generally distributed in July, August, and September.

X. flavago (silago).—I have taken this species in September at Methop, Witherslack, Grimshaw Lane, County Asylum grounds, and Blea Tarn.

Cirrhaedia xerampelina.—Not common; Blea Tarn, Clougha, Lancaster, Arnside, Halton, Caton, &c., end of August. The var. *unicolor* is rare, odd examples occasionally at Clougha and Arnside.

Cosmia paleacea (fulvago).—Scarce. I have only bred it from Methop larvæ taken from oak in early June. The imago appears in August.

Calymnia trapezina.—Fairly common and generally distributed throughout the district in August.

Dianthæcia cucubali.—I have only taken this species between Caton and Quernmore in June.

Polia chi.—Abundant on the walls about Clougha, Lancaster, Quernmore, Halton, and Caton, &c., in September and October. The var. *olivacea* is scarce.

Miselia oxyacanthæ.—Abundant at sugar in September; Halton, Grimshaw Lane, Blea Tarn, County Asylum grounds, &c. The var. *capucina* occasionally.

Agriopsis aprilina.—Not common, but occurs in most of the localities throughout the district. Comes to sugar in October.

Euplexia lucipara.—Fairly common at sugar in June and July, and again in September; County Asylum grounds, Clougha, Witherslack, &c.

Phlogophora meticulosa.—Common at sugar in September and October; County Asylum grounds, Halton, Aqueduct Wood, Freeman's Wood, Witherslack, &c.

Aplecta nebulosa.—Common, but local; Witherslack and Methop. Comes to sugar in June. This species varies considerably in ground colour—ranging from light grey to nearly black (the latter is rare—var. *robsoni*).

A. tincta.—Local; near Witherslack end of June.

Hadena protea.—Fairly plentiful near Clougha, Quernmore, Blea Tarn, &c., in September.

H. glauca.—Local and not common. I have only taken this species at rest on the rocks near Clougha in June and early July.

H. dentina.—A few at sugar, but more frequently at rest on the stone walls and rocks in the vicinity of Clougha in July.

H. dissimilis (suasa).—Not common; odd examples come to sugar in the County Asylum grounds, and I have bred specimens from Methop larvæ. The imago appears in June.

H. oleracea.—Common at sugar and privet-bloom in July; and generally distributed.

H. pisi.—Fairly common at Witherslack and Methop in June. This species is very variable.

H. thalassina.—Not common; examples come to sugar in most seasons at Blea Tarn, County Asylum grounds, Quernmore, &c., in June.

Xylocampa areola (lithorhiza).—Fairly common in some seasons; appears in March and April, and comes to willow-bloom.

Calocampa vetusta.—Uncommon; comes to sugar and ivy occasionally in October in the County Asylum grounds, at Blea Tarn, and Quernmore.

C. exoleta.—Fairly common and generally distributed; comes to sugar and ivy-bloom in October and November.

C. solidaginis.—I have only taken this species near Clougha and in the County Asylum grounds; end of July.

Xylina conformis.—Very rare. I took two specimens at ivy-bloom on October 22nd, 1902, near Lancaster; vide 'Entomologist,' vol. xxxv. p. 25.

(To be continued.)

NOTES AND OBSERVATIONS.

DYTISCIDS IN THE NEW FOREST.—Mr. Ansorge (Entom. xxxvii. 241) asks if anyone knows of the occurrence of *Deronectes latus* in the New Forest. I may therefore say that there is a stream in the forest in which it may always be found in early June. I was very much surprised when I first found it there, a good many years ago. Another rare Dytiscid occurring in the forest I think has not been recorded, viz. *Hydrovatus clypealis*. This lives in a pond near Lyndhurst, in company with *Pelobius hermanni*.—D. SHARP; Cambridge, May 9th, 1905.

LONDON LEPIDOPTERA.—I should be very grateful if any of your readers would kindly supply me with the names of Macro-Lepidoptera actually seen or captured inside the "four-mile radius" at any time since, and including, 1900. I trust it will be noted that I desire personal experiences only.—GEORGE LOCK; 41, Nithdale Road, Plumstead, S.E., May 16th, 1905.

EUPITHECIA STEVENSATA.—When collecting in Freshwater, Isle of Wight, last September, I captured a *Eupithecia* which puzzled me to name. I have just shown the specimen (which is in perfect condition) to my friend Mr. L. B. Prout, and he informs me that it is undoubtedly *E. stevensata*. The specimen was caught while duskling along an ordinary hedgeside where a few tamarisks were growing, but certainly no juniper. This substantiates the statement, made some time ago by Mr. Sydney Webb, that the insect appears in September, and that the larva does not feed on juniper. As the insect had never to my knowledge been caught outside the Dover district, I thought the record might prove of interest.—J. P. MURCH; 415, Hornsey Road, N.

[Barrett, in 'British Lepidoptera,' treats *stevensata* as a form of *E. sobrinata*. "If this form," he remarks, "when reared, should appear to be distinct from *E. sobrinata*, it will be an exceedingly difficult species to describe, seeing that although the shade of colour is peculiar, the markings, though differing in intensity, are accurately the same."—ED.]

APAMEA OPHIOGRAMMA.—Is *Poa aquatica* a usual food-plant for this species? I have found no less than six larvæ this year feeding upon it. Both *Phalaris arundinacea* and *Poa aquatica* grow together along the margins of the streams here, and I get larvæ of *A. ophiogramma* in both, although mostly in the *Phalaris*. *A. didyma (oculea)* feeds commonly on *Poa aquatica*, but is not very abundant on *Phalaris arundinacea* in this district.—FRANCIS C. WOODBRIDGE; Northeroft, Uxbridge.

NOTE ON HAWORTH'S TYPE-SPECIMEN OF "NOCTUA SUBFUSCA."—At the sale of the first portion of the Mason Collection, Lot 498—which included Haworth's original type-specimen, bearing his own MS. label "*subfusca*," of his *Noctua subfusca*—became my property. The moth, which was first described by him in Lep. Brit. p. 114, as "*Bombyx subfuscus*," but was afterwards, on p. 219 of the same work, assigned a more correct position under the name "*Noctua subfusca*," is an obscurely-marked fuscous example of *Agrotis corticea*, Hb., and the name has been rightly sunk as a synonym of *corticea*. I observe, how-

ever, that in the Entom. Syn. List, p. 7 (1884), *subfusca* is specially indicated as being referable to the female sex of *A. corticea*, and is not entered as a variety, whereas the type-specimen, which I am about to present to the National Collection, is unquestionably a male, as proved both by the antennæ and the frenulum, and represents a decidedly aberrant form, for which the name *subfusca* must be retained, of this species.—EUSTACE R. BANKES; Norden, Corfe Castle, May 11th, 1905.

THE MASON COLLECTION.—With reference to the notice (*antea*, p. 136) of the sale of this collection, it seems advisable to mention that the MS. label on the pin of the Norfolk specimen of *Notodonta tritophus*, Esp. (rendered as "*trilophus*," loc. cit.), read "Ersham, Norfolk, Garneys." "Ersham" is obviously a mistake for "Earsham," in south-east Norfolk, which is close to Bungay (in Suffolk), where Messrs. Charles and W. Garneys used to reside (*vide* Ent. Ann. 1856, p. 18). In the sale catalogue "Garneys" was incorrectly rendered "Gurney," and the attempt to quote (*antea*, p. 136) the exact data given in the catalogue has further resulted in "Ersham" of the catalogue appearing as "Ergham." I also notice that it is stated (*antea*, p. 136) that "Five *Synia musculosa* were disposed of at 5/- to 11/- each," but would point out that whereas this is true of the last four of the five specimens sold separately and apart from other species, the first of the five fetched 22/-.—EUSTACE R. BANKES; Norden, Corfe Castle, May 10th, 1905.

ENTOMOLOGICAL CLUB.—A meeting was held at Wellfield, Lingards Road, Lewisham, the residence of Mr. Robert Adkin, the host and chairman of the evening. Other members present were Messrs. Donisthorpe and Porritt. Mr. Lucas exhibited a living example of each sex of *Agrion armatum* from Cambs.

CAPTURES AND FIELD REPORTS.

DEILEPHILA LIVORNICA IN CORNWALL.—On April 16th last, at Charles-town, there was taken a specimen of *D. livornica*, which is now in my possession. I believe that four other specimens were taken about the 17th inst. *viz.*:—one Grampound Road, one Helston, one Falmouth, and one at Hayle; all in Cornwall. For three days preceding the 16th inst. very strong south-south-east and south winds prevailed here, so I assume that these insects, at least, were helped along thereby, on their long journey.—H. D. KENYON; Lamorna Villas, Mount Charles, St. Austell, April 28th, 1905.

DEILEPHILA LIVORNICA IN WALES.—On April 20th last, a good specimen of *D. livornica* was brought to me by a little girl. She had found it in a hole in the garden. It was alive, and quite perfect, although the girl carried it in a small tumbler. There is no doubt about its being a true British specimen of that somewhat rare species. I would have sent a record of this capture before, but I have been away from home.—L. STAFFORD; Gold Croft, Caerleon, near Newport, Monmouth, May 16th, 1905.

NOTES FROM THE CHESTER DISTRICT FOR 1904. — Contrary to the predictions of certain, or, more accurately speaking, uncertain weather prophets, the summer of 1904 turned out to be sunny, warm, and enjoyable. The months of June, July, and August had especially high temperatures and clear atmospheres, and August 4th, when Londoners sweltered in 91° (shade reading), had the distinction of being the hottest day for four years. As usual, the weather became unsettled about August 12th, summer returning towards the end of the month. It was an especial matter of interest to me to see if the two previous cold wet summers would have any appreciable effect on the numbers of the butterflies. The following species were conspicuous by their absence, either as larvæ or imagines:—*Vanessa io* (I saw none).—*V. urticae* (I do not remember seeing one).—*V. atalanta* was represented by a few specimens. Mr. J. Thompson took five larvæ and one pupa off nettles just outside Chester. One of the butterflies was seen, September 11th, in the Grosvenor Park; one in Delamere Forest, August 30th; two in Delamere Forest, September 10th; and I saw six feeding on heather-bloom, September 17th, in the same locality. I did not see *V. cardui* at all. But, as all other butterfly species of the district seemed up to their usual numbers, it was evident that the failures in *Vanessidæ* could hardly be attributed to the two preceding seasons. Much more likely are they due to the growing practice of cutting down almost every available nettle and thistle, just when the larvæ are most dependent upon these food-plants.

Electric lamps were almost a failure—certainly not worth working. My best capture was an example of *Cirrhædia xerampelina*, August 30th. Several specimens of *Sphinx convolvuli* were taken in September. In connection with moths being attracted by light, it may be worth recording that a *Plusia gamma* flew into a farmhouse during a fall of snow on the night of November 21st.

I will only mention the most interesting moths that I obtained in various localities:—*Sesia scoliiformis*. I was well within striking distance of a fine fresh female at rest on birch in Delamere Forest, June 4th. Although it was a good shot for the net, I unfortunately missed it. This is, to my knowledge, the second specimen seen in Delamere Forest.—*Charocampa porcellus*. A freshly emerged specimen netted by Mr. J. Thompson at flowers of white campion, Delamere Forest, on the night of June 17th.—*Rusina tenebrosa*. Common in Delamere Forest in June. All specimens melanic forms.—*Hepialus velleda* var. *carnus* (almost unicolorous brown, markings indistinct). One, Delamere Forest, July 8th.—*P. iota*. A melanic specimen, Delamere Forest, July 8th.—*Stilbia anomala*. One, the Leet, Valley of the Alwyn, Denbighshire, July 30th.—*Acidalia dilutaria*, Hübn. Previously recorded in the district by Gregson only. One netted by me in Delamere Forest on the night of July 8th.—*A. aversata*. A rosy-brown form blotched with darker instead of bands on the upper wings, Delamere Forest, July 1st.—*Emmelesia decolorata*. Plentiful about Chester and in Delamere Forest, June and July.—*Boarmia repandata*. A black specimen taken near Chester, July 5th.—*B. rhomboidaria*. A melanic form taken near Chester, August 2nd. It laid a number of red eggs. (The eggs of *B. repandata* are dull green.)—*Hypsipetes elutata*. A beautiful green form (upper wings), August 4th.—*Pericallia syringaria*.

One, Delamere Forest, July 8th.—*Eupithecia trisignaria*, H.-S. I had the good fortune to net one (Delamere Forest) on the night of July 1st. The previous occurrence in the district rests on a doubtful record.—*Mimaseoptilus bipunctidactyla*, Haw. Common on the Leet carboniferous limestone, Denbighshire, August 12th.—*Acipitilia tetradactyla*, L. A small whitish plume not previously recorded. Common on the Leet, Denbighshire, July.—*Pterophorus monodactylus*, L. One beaten out of Scotch fir in Delamere Forest, October 1st.—*M. pterodactylus*, L. Common in Delamere Forest, July 8th, but rather worn.

The following Micros were taken, or bred from larvæ, in or near Chester:—*Orthotelia sparganella*, Thnb.; common on marshy places in August. *Depressaria liturella*, Schiff., and *Aphelia osseana*, Sc.=*pratana*, Hb.; both on the Lache Eye in August. *Epiblema similana*, Hüb.; *Acalla hastiana*, modification of var. *autumnana*, Steph.; *A. hastiana*, L., var. *radiana*, Hüb.; *Endrosis lacteella*, Schiff.=*fenestrella*, Stt.; *Ancyliis biarcuana*, Steph.; *E. subocellana*, Don.

From Delamere Forest:—*Depressaria applana*, Fabr.; *Pandemis corylana*, Fabr.; *Cerostoma radiatella*, Don., a very variable species; *Pandemis heparana*, Schiff.; *Pleurota bicostella*, Cl.; *Scoparia ambigualis*, Tr.; *Olethreutes corticana*, Hüb.; *Cacacia lecheana*, L.; *Acompsia pseudospretella*, Stt., almost black (also Chester examples).

From the Leet, Denbighshire:—*A. osseana*, Sc.=*pratana*, Hb.; *C. radiatella*, Don.; *Acalla variegana*, Schiff.

Hybrids between *Smerinthus ocellatus* (female) and *S. populi* (male): From the eight pupæ referred to (Entom. xxxvii. 25) six fine moths emerged in June—three on the 4th, one on the 5th, one on the 6th, and the sixth on the 17th—all apparently males. As the sexes of the parent moths were the same as those referred to by Mr. P. Kirk, of Dundee (Entom. Record, i. 95), I was curious to see how my hybrids would compare with those reared by Mr. Kirk. Mr. Tutt's description of five of the latter (Entom. Record, i. 203) fits so accurately with my hybrids that I give his description *verbatim*:—"They are perfectly intermediate between the two species. The fore wings have all the characters of both species, the basal line as in *populi*, but with distinct traces of a shade showing the angulation of the basal line in *ocellatus*, the hind wings have the fulvous basal patch of *populi* (no red colour), and indistinct eye-spots characteristic of *ocellatus*."

S. tilia.—From the fifteen pupæ referred to (Entom. xxxvii. 25), I got ten moths in May—two females on the 18th, a male and female on the 20th, a male on the 21st, a male and female on the 22nd, a crippled female on the 23rd, and a male and female on the 24th; four males and six females in all. This moth might more accurately be named the "elm moth," as I found, in agreement with the experience of others, that the larvæ prefer elm to lime.

Arctia caia.—A third brood of imagines (forced) began to appear November 18th, and continue now (February). As in the second brood, which began to emerge on September 4th, the perfect insects were in company with caterpillars of the same brood in every stage of growth. With the exception of a fine female, in which the cream-coloured area of the upper wings is increased, all the moths so far have been typical. The insect does not seem to vary perceptibly in this district, even with forced successive broods. The eggs laid by moths

of the third brood have, in my case, all turned out infertile, although a friend tells me his experience of the same brood has been quite the reverse. I kept my larvæ in cages placed on a warm kitchen shelf by the fireplace, and fed them on dock and groundsel.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*May 3rd, 1905.*—Mr. F. Merrifield, President, in the chair.—Mr. J. Butterworth, B.Sc., was elected a Fellow of the Society. Mr. M. Jacoby exhibited a series of *Xenarthra cervicornis*, Baly, from Ceylon, and drew attention to the curious structure of the antennæ of the male, that of the female being simple.—Mr. G. T. Porritt, specimens of *Tephrosia consonaria*, ab. *nigra*, and melanic examples of *Boarmia consortaria*, all from a wood in West Kent, by Mr. E. Goodwin. These forms were exactly on the same lines as the melanism in West Yorkshire, and it is curious they should occur in such widely separate localities. The two genera, however, are evidently prone to melanism, as Mr. Porritt stated that he had now seen black or almost black specimens of all the British species except *Tephrosia punctulata*.—Commander J. J. Walker (1) two specimens of the very rare Staphylinid, *Medon castaneus*, Grav., taken in the Oxford district during the last week of April, 1905; (2) several examples of both sexes of the giant flea *Hystrichopsylla talpæ*, Curtis, from field-mouse nests in the same district; and (3) the type-specimen of the Bostrichid beetle, *Dinoderus ocellaris*, Steph. (taken by the late Prof. Westwood at "Little Chelsea" previous to 1830), from the Hope Collection at Oxford.—Professor E. B. Poulton, F.R.S., read a note on "Heliotropism in *Pararge* and *Pyrameis*," communicated by Dr. G. B. Longstaff, M.D.—Professor L. C. Miall, F.R.S., communicated a paper on "The Structure and Life History of *Psychoda sexpunctata*, Curtis," by John Alexander Dell, B.Sc.—Dr. D. H. Hutchinson gave an address on "The Three-colour Process as applied to Insect Photography," illustrated by lantern slides of British and Indian Rhopalocera, the exhibits showing a marked advance in excellence upon any yet shown at the Society's meetings. The President, at the close of the proceedings, heartily congratulated Dr. Hutchinson upon the results of his work.—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 18th.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Winkworth, of Burdett Road, E.; Mr. Wright, of Woolwich; and Mr. Penn Gaskill, of Wandsworth Common, were elected members.—Mr. Harrison, living larvæ of *Agrotis ashworthii* from North Wales.—Mr. West, *Lebia cyanocephala* and *L. chlorocephala* from Box Hill.—Mr. Edwards, a number of species of the South American groups of *Papilio*, *Endopogon*, *Hectorides* and *Parides*.—Mr. Kaye, long series of *Heliconius numata*, showing extensive variations, in the hind wings particularly; and also pairs of *H. sylvana* and *H. novatus* (?); all were from British Guiana.—Mr. Turner, cases of *Cleophora saturatella*.

on broom.—Mr. Sich read a paper entitled, "The Spot we stand on," and illustrated it with lantern slides.

April 27th.—The President in the chair.—Mr. Bevins, of Ongar, was elected a member.—Messrs. Harrison and Main exhibited larvæ of *Nemophila russula* in their last stage; they were from ova laid by a Cheshire female, and were feeding on dandelion. Mr. Cowham had reared a brood in the autumn from spring ova. Mr. Main showed his method of holding a twig with a larva or imago in position for photographing, by means of a compound clamp or test-tube holder and retort stand, such as are used by practical chemists. He also exhibited a ball-and-socket arrangement for fitting on a camera-stand to allow of inclination of the camera in any direction.—Mr. Adkin read a paper on "Belated Emergences," and exhibited various species in illustration. H. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The third ordinary meeting was held in the Society's rooms, Royal Institution, Liverpool, on March 20th, Mr. Richard Wilding, Vice-President, in the chair.—Donations to the Library were announced from Messrs. B. H. Crabtree, F.E.S.; H. B. Score, F.R.G.S.; Jas. Fletcher, LL.D., F.L.S., and C. M. Adams, F.I.C. This meeting took the form of a microscopical, lantern, and general exhibitional meeting, and proved to be a most popular and successful innovation, the number of members and their friends present being considerable, and including several ladies. In addition to the various microscopical exhibits of members, ten members of the Liverpool Microscopical Society contributed greatly to the success of the evening by their exhibits, and the Society is much to be congratulated on securing their invaluable co-operation. The first half of the meeting was devoted to the microscopes and general exhibits.—Mr. J. M. Williams's slides included the suckers of *Dytiscus* and the head of the jumping spider, *Salticus tardigradus*; Mr. Garnett showed the "fairy fly," *Anagrus incarnatus*, and the Hessian fly; Mr. F. N. Pierce, the chirping drum and file of the common house-cricket; Mr. D. Whittaker, the strigil of *Corixa geoffroyi* and other slides of Aquatic Hemiptera; Mr. J. E. Turner, head of plumed gnat, and ichneumon flies; Mr. A. H. Dudley, the circulation of protoplasm in *Nitella* and *Elodea*, and a *Cyclops* carrying eggs; Mr. C. M. Adams, the larva, and male and female imagines of the itch-insect, *Sarcoptes scabiei*; Mr. W. T. Haydon, sections showing development of embryo of *Pinus sylvestris*; Mr. E. J. B. Sopp, larva of *Meloe proscarabæus* and spiracles of *Dytiscus marginalis*. Among other interesting slides on view were the tracheal system of silkworm; parasite of mouse, showing its victim's blood in its stomach; wing-case of tiger-beetle; transverse section of caterpillar, showing its last meal, &c. The general exhibits were varied and instructive. The President, Mr. S. J. Capper, sent his well-known educational collections, representing all the orders of insects; Mr. W. A. Tyerman, a series of bred *Selenia illunaria*, and some beautiful moths from Winburg, Orange River Colony; Mr. F. R. Dixon-Nuttall, specimens of the North American Longicorn *Neoclytus erythrocephalus*, found seven inches below the bark of an ash supposed to have grown in the St. Helens district; Dr. W. Bell, preserved larva of *Noctua triangulum*; Mr. Horton, larvæ of *Tro-*

chilium bembeciformis in willow stems; Mr. J. R. le B. Tomlin, a case of exotic *Cetoniidæ* and one of goliath beetles, including *Goliathus druryi*, *G. giganteus*, and *G. cacicus*; Mr. R. S. Bagnall, *Leptura pubescens*, *Sinoxylon anale*, *Chrysobothris chrysostigma*, and a number of other foreign beetles introduced into the Hartlepool district in timber. Mr. Sopp, British burying-beetles, borings of *Hylesinus fraxini* in ash and locusts; Mrs. Sopp, the leaf insect, *Phyllium scythe*; Mr. Whittaker, *Gerris canalium*, from the canal at Marple; Mr. Pierce, a large wasp, probably *Vespa mandarina*, captured by Mr. Wm. Johnson in the district about sixty years ago; Mr. H. R. Sweeting, a model-map of the "Liverpool District," taken from the one-inch ordnance map, revised to 1895, &c. Refreshments were served at 8.30, after which there was an excellent lantern demonstration. Among excellent photographs of insects, by Mr. Henry Ball, Mr. Whittaker, and Mr. Oulton Harrison, one of *Helops striatus*, showing bifurcated antenna, exhibited by Mr. Harrison, was especially interesting.—E. J. B. SOPP and J. R. LE B. TOMLIN, *Hon. Secretaries*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—*January 4th, 1905*.—The President, Dr. W. E. Hoyle, presided over a large gathering of members on the occasion of the Annual Meeting. A general outline of the work of 1904 was read by the Secretary, and the Treasurer's statement showed a balance in hand of nearly £4. Four friends were nominated for membership. The following officers were elected for 1905:—President, B. H. Crabtree, F.E.S.; Vice-President, R. Tait, Jr.; Hon. Treasurer, W. Buckley; Hon. Secretary, R. J. Wigelsworth; Librarian, C. F. Johnson; Council, J. Ray Hardy, Geo. O. Day, F.E.S., and W. Warren Kinsey. In a brief address the retiring President, after congratulating the Society on its successful career, said a word of warning was necessary. The reading of papers and exhibiting of specimens were good and helpful, but the usefulness of the Society would be impeded if a wider outlook of the insect world was not taken. To do useful work, members must take up other orders of insects besides Lepidoptera, some of the less known groups, read and carefully study them, and ultimately become authorities regarding them. The following exhibits were shown:—Mr. Geo. O. Day, cocoons of *Hemerophila abruptaria*.—Mr. R. Brauer, case containing species of *Argynnis*, from the United States of America.—Mr. L. Krah, Lepidoptera bred from ova obtained from the Continent: *Catocala fraxini*, *C. nupta*, *C. sponsa*, *C. elocata*, and *C. paranymphea*. The members afterwards attended a demonstration on "Recent Researches in Mimicry," delivered by Dr. W. E. Hoyle.

February 1st.—The President, B. H. Crabtree, F.E.S., presided. The following were elected members of the Society:—Messrs. C. E. Iveson, C. Camp, Herbert M. Leach, and Harold S. Leigh. Mr. W. Warren Kinsey was elected Assistant Secretary, and Dr. W. E. Hoyle was elected to fill the office left vacant on the Council. A paper entitled, "Extracts from an Accentuated List of British Lepidoptera," was read by Geo. O. Day, F.E.S. The pronunciations of the Latin names were based on the authority of a publication by the Entomological Societies of Oxford and Cambridge. Many groups of Lepidoptera were dealt with, and in some cases the original meaning of the names were explained. Messrs. B. H. Crabtree, R. Tait, Jr., L. Krah, and other members commented upon the essay, and at the conclusion

a hearty vote of thanks was passed to Mr. Day. The following exhibits were shown:—Mr. B. H. Crabtree, specimens of *C. plantaginis*, showing var. *hospita*, in which the orange colouring is replaced by white.—Mr. R. Tait, Jr., Lepidoptera bred from ova and larvæ: *Boarmia repandata*, well-marked examples, bred from Welsh larvæ; *Aplecta advena*, two specimens bred in November from forced larvæ; *A. australis*, taken in the Isle of Wight by Dr. Dewar, of Stanley; *Nyssia lapponaria*, bred by Mr. A. E. Cockayne from Rannoch ova.—Mr. J. Ray Hardy, specimens of *Vanessa io* from Grange-over-Sands, fed on nettle and lettuce, showing difference in imago,—wings being in some cases semi-diaphanous, the upper being of a dark purple colour; photograph of the larvæ of *Morpho epistrophis*.—Mr. H. S. Leigh, parasite of *Saturnia pyri* (July, 1904); *Sphinx convolvuli*, in perfect condition, taken near Worsley, Sept., 1904.—Mr. G. Kearney, fifteen species of Coleoptera taken on a small plot of ground near Philips Park, Bradford, near Manchester.

March 1st.—In the absence of the President and Vice-President, the chair was occupied by Mr. C. F. Johnson. After the formal business of the meeting, an adjournment was made to another part of the Manchester Museum, when one of the members, Mr. A. E. Thomson, delivered a lecture (to which the public were invited), entitled, "The House Fly" (illustrated by lime-light views). This was enjoyed by an exceedingly good gathering of persons, and at the close was followed by discussion.—ROBERT J. WIGELSWORTH, *Hon. Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 20th, 1905.*—Mr. G. T. Bethune-Baker, President, in the chair.—Sir George Hampson was elected an honorary member of the Society.—Mr. A. H. Martineau showed a specimen of *Zeuzera pyrina*, L., taken at light at Solihull; also an entirely black specimen of *Formica rufa*, L., from Hay Woods.—Mr. S. H. Kenrick, a fine lot of Pyralidæ from New Guinea, including some new and many rare species.—Mr. H. W. Ellis, a specimen of the rare beetle *Platydemus dytiscoides*, L., from the New Forest.—Mr. Colbran J. Wainwright, four specimens of *Ptilops nigrita*, Fall., a species of the Tachinidæ new to the British list, which Dr. J. H. Wood had found in various localities in Herefordshire. He said that since receiving Dr. Wood's specimens he had seen one taken by the late Rev. T. A. Marshall near Teignmouth.—Mr. H. W. Ellis, a number of the late John Sang's exquisite colour drawings of insects.—Mr. Gilbert Smith, a specimen of *Callidium violaceum*, with two tibiæ and two tarsi on the left hind leg; the supernumerary tibia left the normal one in about the middle, but was traceable below that; it had normal metatarsi, thickened tarsi, and two claws, so that there were three claws on that leg. He also showed the rare Longicorn *Mesosa nubila* from the New Forest; also a number of an ichneumon found in the refuse stuff of an old tree-trunk infested by *Rhagium bifasciatum* upon which it most likely lived; they were in great numbers, and all huddled together for hibernating.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

ERRATUM.—The notice of Prof. Packard, referred to in our last, appeared, not in the 'American Naturalist,' but in the 'American Journal of Science' for March, 1905, p. 264.

36

41

42



BRITISH WATERBUGS.

THE ENTOMOLOGIST

VOL. XXXVIII.]

JULY, 1905.

[No. 506.]

DESCRIPTION OF A NEW SPECIES OF LYGÆIDÆ FROM SOUTH AFRICA.

By W. L. DISTANT.

SOME time since a Lygæid was sent to me from the Cape Colony which was described as "injurious to peach." Many occupations prevented my identifying it at the time, and I was recently reminded of my obligation by an enquiry from Mr. F. V. Theobald, who had received the species from another African habitat, where it was destructive to "cotton seed." I therefore examined the insect, which appears to be undescribed.

Oxycarenus exitiosus, sp. n.

Black; posterior lobe of pronotum and corium testaceous; a black spot at posterior angle to corium, and the lateral margins to corium sometimes distinctly lutescent; membrane pale grey hyaline; body beneath (imperfectly seen in the carded specimens from which this description is made) black; the abdomen beneath—excluding apex and a central longitudinal medial fascia—sanguineous; posterior angular areas of prosternum testaceous; the coxæ, a central annulation to intermediate tibiæ, and the posterior tibiæ—excluding base and apex—luteous; head and pronotum rugosely punctate, scutellum finely punctate, clavus longitudinally punctate, corium very finely and obscurely punctate; membrane extending beyond the apex of the abdomen; antennæ moderately robust, second joint longest and slender towards base, third and fourth subequal in length, third distinctly narrowed at base; head and pronotum laterally rather longly pilose. Long. 3 to 4 millim.

Hab. Cape Town; Seapoint. "South Africa" (Mansell Weale).

DESCRIPTIONS OF THREE UNDESCRIBED GENERA
OF ICHNEUMONIDÆ FROM BORNEO.

BY P. CAMERON.

ACENITINI.

PHALEGA, gen. nov.

Wings without an areolet; second recurrent nervure received behind the transverse cubitus, widely distant from it; disco-cubital nervure broken by a stump of a nervure, transverse median nervure received beyond transverse basal; transverse median nervure in hind wings broken at the middle. Wings longer than the body. Basal joint of hind tarsi fully longer than the following two united. Parapsidal furrows deep; the mesonotum clearly trilobate. Metanotum with a keel above the apical slope. Petiole stout, three times longer than wide, clearly separated from the second; ovipositor not much longer than the abdomen. Four front claws cleft. The second abdominal segment is wider than long; the hypopygium in the female does not project beyond the tip of the abdomen. Head not much wider than the thorax; apex of clypeus with a small but distinct tubercle in the middle of the apex. Hind coxæ short, about twice longer than wide. Colour uniformly rufous. First joint of flagellum nearly as long as the following two united.

Comes closest to *Collyria* and *Chorischizus*.

PHALEGA LUTEA, sp. nov.

Rufous-luteous, the flagellum of antennæ and apex of tibiæ fuscous; the hind tarsi black. Wings bright luteous hyaline, the apex of the fore wings behind and of the hind pair all round, smoky; the nervures and stigma bright luteous. ♀. Length, 12 mm.; ovipositor, 6 mm.

Matang. August (R. Shelford, M.A.).

Face and clypeus strongly and closely punctured; the face roundly projecting in the middle; the clypeus with a tubercle on either side above. Vertex almost smooth. Front deeply excavated in the middle, its centre with a distinct longitudinal keel; the sides punctured. Thorax closely punctured, smooth on the apex of the mesopleuræ and on the base of metapleuræ. Base and apex of metanotum smooth; the middle punctured and with some striæ. Abdomen smooth. Recurrent nervure distant from the transverse cubital by three-fourths of the length of the latter; its front half roundly curved. Hind legs very long; the femora not greatly thickened, but still clearly thicker than the much longer tibiæ.

DINOCRYPTUS, gen. nov.

Areolet large, square, not narrowed in front; transverse median nervure almost interstitial; disco-cubital nervure not broken, the radial cellule elongate; transverse median nervure in hind wings broken below the middle. Wings uniformly fuscous violaceous. Median segment without keels; the apical slope tuberculate on the

sides above; spiracles large, linear. Abdominal petiole stout, becoming gradually slightly wider towards the apex, where it is twice the width of the base; the post-petiole not separated; the spiracles placed close to the middle; those on second placed at the apex of the basal third. Clypeus clearly separated, its apex in the middle with two short rounded teeth; the sides with a hollowed rounded dilatation. Fore tibiæ thickened, narrowed at the base; basal joint of tarsi longer than all the rest united.

This genus, like *Echthrus*, *Torbda*, &c., is intermediate between the Cryptinæ and the Pimplinæ; from the position of the spiracles on the abdominal segments, they may be placed in the Xoridini. The mesopleuræ, as in the Cryptinæ, are bordered by a furrow; and, as in that group, there are parapsidal furrows. Its affinities are clearly with *Torbda*, Cam., from which it may be known (the coloration being also very different) by the bidentate apex of clypeus, smaller square areolet, tuberculate apex of metanotum, and longer metatarsus. *Echthrus* and *Nyxeophilus* are placed by some authors in the Cryptinæ; by others in the Pimplinæ; probably there will be also a difference of opinion as to the position of *Dinocryptus* and *Torbda*.

DINOCRYPTUS NIGER, sp. nov.

Black; thorax, base of abdomen and of legs thickly covered with short black pubescence; wings uniformly fuscous violaceous. ♀. Length, 21 mm.; ovipositor, 10 mm.

Kuching. April (R. Shelford, M.A.).

The entire body is closely punctured. Basal part of metanotum slightly carinate in the middle, and slightly depressed on either side of the centre. There is a pale white line in the centre of the orbits on the outer and inner. The second to fifth abdominal segments have transverse impressions near the middle. The last segment is large, depressed at the base; the apex is depressed above, and is thickly covered with long black hair. Antennæ long, slender, the basal two joints of flagellum equal in length.

XORIDINI.

CÆNOSTOMA, gen. nov.

♂. Upper part of clypeus short, obliquely projecting; the lower part longer, not obliquely projecting, obliquely narrowed, the apex transverse. Labrum large, semicircular, fringed with long hair. Mandibles edentate, broad at the base, narrowed towards the apex. Malar space furrowed, as long as the antennal scape. A furrowed keel between the antennæ. Head cubital, temples broad, occiput transverse, margined. Thorax four times longer than wide, largely developed before the wings; mesonotum 3-lobate. Scutellum flat, two large deep foveæ at its base. Post-scutellum stoutly keeled on the sides. Metanotum longer than broad, flat, with the apex rounded, longitudinally reticulated; the spiracles longish oval. Wings without an areolet, the recurrent nervure received beyond the transverse

cubital, the transverse median behind the transverse basal. Radial cellule long, lanceolate. Transverse median nervure in hind wings broken below the middle. Abdomen narrow, as long as the head and thorax united; the first segment long, the basal half narrowed; it is nearly as long as the following three segments united; spiracles placed behind the middle; a triangular depression at its apex; the second and third raised in the middle, the raised part bordered behind by furrows. Hind coxæ about six times longer than thick; the trochanters long; both united are longer than the femora, which are stout; tibiæ long, calcaria short; basal joint of tarsi longer than the others united. Claws simple. Antennæ slender, filiform, longer than the body, narrowed towards the apex. Palpi long. The antennæ are not densely haired; the first abdominal segment is transverse at the apex; the second longer than wide; the head is not dilated behind the eyes; the front tibiæ slender, not inflated. At the apex, laterally, the metanotum projects into blunt teeth. Stigma distinct, linear.

The affinities of this genus may be left over for discussion when the female becomes known. Very probably the female antennæ are broken, as in *Cyanoxorides* and *Spiloxorides*. The hind legs (and especially the coxæ) are much longer than they are with these genera.

CÆNOSTOMA FILICORNIS, sp. nov.

Black; lower part of clypeus, labrum, palpi, the orbits—the hinder broadly—edge of pronotum, scutellum, the metanotal tubercles, and the apices of the abdominal segments—the first band dilated at the sides—the second, third, and fourth in the middle, and the ventral surface, pale yellow. Legs pale yellow, the hind femora fulvous; the apex of hind coxæ, trochanters, apex of femora and of tibiæ more broadly, yellow. Antennæ much longer than the body, fuscous, a broad white band before the middle. Wings hyaline, the stigma and nervures black, the former white at the base. ♂. Length, 13 mm.

Kuching. November (R. Shelford, M.A.).

Antennæ towards the apex covered with depressed hairs. Face punctured and more or less striated; the rest smooth and shining. Middle lobe of mesonotum transversely striated; the depressed apical middle part with three longitudinal keels. There are five rows of irregular, longish longitudinal reticulations; the apical slope with three areas, of which the central is the larger. Pro- and mesopleuræ smooth, the metapleuræ coarsely reticulated. Base of first abdominal segment smooth, bicarinate in the middle, the rest closely reticulated; the white apical part obscurely striated laterally, the centre smooth; the basal part of the second segment punctured, strongly, but not closely, the basal central furrow stoutly, transversely striated, the raised central part longer than its width at the apex, triangular; that on the third shorter, broader, rounded at the narrowed base.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC RHYNCHOTA).

BY G. W. KIRKALDY, F.E.S.

(PLATE II.)

(Continued from vol. xxxiii. p. 152.)

SINCE publishing the last instalment of this "Guide," Mr. Halbert informs me that a dead *Aphelocheirus* was taken by Mr. Buckle from Loch Neagh in Ireland. I presume this was recorded in the 'Irish Naturalist' at the time, but I have unfortunately no access to this journal.

ILYOCORIS CIMICOIDES (Linné).

In *Ilyocoris* the same general appearance obtains as in *Aphelocheirus*, but the dorsal part of the head is bent under in front, the antennæ shortened and thickened, the anterior femora greatly thickened, and the posterior tibiæ and tarsi somewhat modified for natatory purposes.

The rostrum is considerably shortened, not extending beyond the anterior coxæ. The antennæ are composed of four segments, and do not reach, when extended, beyond the lateral margins of the head; the head is excavated [viewed from below] beneath the apical segments of the antennæ, forming what is probably an auditory chamber for the intensifying of sounds.*

The anterior femora are greatly thickened, as mentioned above, but are *not* suddenly amplified in a right angle at the base beneath and then narrowed. Also internally beneath there is a broad pad of hair the whole length (fig. 45).

There is only one British species, *I. cimidoides* (Linn.); the head, pronotum, scutellum, connexivum, legs, under side, &c., are pale greenish testaceous; the head, pronotum, &c., irregularly punctured with brown. The intermediate and posterior legs are well furnished with brown spines. The elytra dark greyish brown, very closely and finely punctured. Abdomen black above.

It is excellently figured by Douglas and Scott, and also very well by the old author A. J. Rösel von Rosenhof ('Der Monatlich-

* I have noted in the 'Entomologist' (xxxii. p. 114) that *Microvelia pygmaea* does not use the antennæ as tactile organs. Newport ("On the Use of the Antennæ in Insects," 1840, Trans. Ent. Soc. Lond. ii. p. 235), however, considers that the antennæ in water cimices (i. e. *Ilyocoris*) and *Notonecta* are auditory, sometimes also tactile, certainly not smell organs. They are of great though not of vital importance. He frequently observed the above-named bugs sticking to the sides, and lying beneath the wall of an outhouse that had recently been covered with coal-tar, which emits an odour of carburetted hydrogen, the gas that is so abundantly formed in stagnant pools.

herausgegebenen Insecten-Belüstigung,' iii. pl. 28 (1755)) under the name of the "broad-bodied black-brown waterbug."*

It is generally common and widely distributed all over England, and the lowland parts of Scotland. It is the *Nepa cimicoides* of Linnæus, the *Nepa naucoris* of De Geer, and the *Naucoris cimicoides* of most authors.

It is a somewhat lazy swimmer, though it can attain to a very considerable speed upon occasion, and it often takes to wing at night. It is very voracious, and, though generally vanquished by the more powerful *Notonecta*, it is sometimes even the victor. The imagines hibernate, and the ova are deposited at the end of March or during April on leaves of water-plants; they are whitish, oblong, subcylindrical, obliquely truncate anteriorly. They have been described at length by Rathke ("Studien zur Entwicklungsgeschichte der Insekten," 1861, 'Stettiner Ent. Zeitung,' xxii. pp. 172-4), who, however, gives July as the month of deposition, and says that they are laid in somewhat great numbers near one another on the under side of the leaves of *Polygonum amphibium*.

The method of oviposition seems to vary. Régimbart (1875, Ann. Soc. Ent. France, pp. 204-6) states that an incision is made in the stems of plants with the ovipositor, about 2 or 3 mm. long, and that the egg is enclosed about three-quarters of its length; one of the ends (corresponding to the cephalic extremity of the embryo) is almost entirely free. Bueno, however, states that in *Pelocoris* the "majority have been found attached axially to the stems or leaves of *Ceratophyllum*, and secured to them by a glue in which the ovum is set, and which surrounds the slender stem or leaf to a variable extent. The adhesion is not very firm, however, and the ova are readily detached." This corresponds to my own observations on *Ilyocoris*, as well as those of Dufour. I have also observed varying conditions in *Notonecta*.

The nymphs, which Rathke states feed on Confervæ, are very similar in all stages to the imago, the tarsi, however, being unjointed, and the lateral margins of the abdominal segments not produced spinosely. I have observed five nymphal instars, thus agreeing with Bueno, who states that there are five in the allied *Pelocoris femorata*, an American bug which he has discussed recently ("Brief Notes towards the Life-history of *Pelocoris femorata*, Pal. B., with a few Remarks on Habits," 1903, Journ. New York Ent. Soc. xi. pp. 166-73, text-figs. 1-2). Bueno gives a total of about seventy-seven days for the metamorphoses, twenty-four of these being in the egg-state.†

* It was also discussed by an old "pre-Linnean" author under the name of *Pygolampis lacustris*! (Johann von Muralto, 1684, 'Ephemere Acad. Nat. Curios, Dec. ii. Ann. ii. Obs. 80, p. 197').

† Extensive researches have recently been made by R. Heymons on the

Ilyocoris, like most waterbugs, is subject to the attacks of watermites (family Hydrachnidæ). After what d'Herculais terms a "bizarre copulation," the eggs are laid in spring in incisions in soft-stemmed aquatic plants, or on the under side of the leaves. The young larva is pale red, six-legged, each leg composed of six segments. These young larvæ, upon hatching, move about in the water, and fasten themselves, often in large numbers, to different water insects by means of sharp hooks at the end of the palpi. Once fixed, the head and mouth-parts stretch until they become separated by a neck from the main body, the transparent skin of which rapidly swells and elongates so as to form a bag, with the more solid dark-red parts visible anteriorly. The elongated maxillæ penetrate and extend beneath the chitinous covering of the host until they form a long pointed thread. The legs curl up, become useless, and are more or less withdrawn. The larva gradually passes to the pupa state within this bag, which becomes more and more swollen and rounded posteriorly, and finally bursts to release the adult eight-legged mite. These bag-like larvæ were looked upon as the eggs of the waterbugs by many old authors, and the bugs were likened to the Surinam toad (*Pipa pipa* (Linn.)), that hatches its eggs on the skin of its own back. The adult swims actively about in the water, but before attaining maturity fixes to some plant, and undergoes another moult without material change of form. On the smaller aquatic bugs only three or four larvæ are perhaps seen, but on certain giant exotics a much greater number are found, as many as five hundred having been counted on a single specimen of *Belostoma fluminea*, Say. The commonest British species appear to be *Hydrachna geographica*, Koch, the imago of which is scarlet and black, and *Hydrochoreutes globulus* (Müll.), a rich purple in the imago state. The American species mentioned above was described as *Hydrachna belostomæ*, Riley; Mr. A. D. Michael examined for me some larval Hydrachnids on a Sinhalese waterbug (*Amorgius indica*) about four years ago, and considered them probably the same as the American form. He concluded: "The watermites, when parasitic, do not usually confine themselves to a single host, but are often found on several species; and the geographical distribution of *Acari* is usually very wide, often astonishingly so."*

embryology and anatomy of *Ilyocoris* (see "Beiträge zur Morphologie und Entwicklungsgeschichte der Rhynchoten," 1899, in *Nova Acta Leop. Carol. Deutsch. Akad.* lxxiv. pp. 355-81, text-figs. ii., and pl. xv. figs. 1, 4, 9, pl. xvi. figs. 15-17, 21-22, pl. xvii. figs. 29).

* Note by G. W. Kirkaldy in E. E. Green, "Biologic Notes on some Ceylonese Rhynchota.—No. 1," 'Entomologist,' xxxiv. p. 116 (1901). See also U.S. Entom. Commission, First Report (1878), p. 313; Künckel d'Herculais, "Les Insectes" in Brehm's 'Merveilles de la Nature,' ii. pp. 757-8 (1883); and Andrew Murray, 'Economic Entomology. Aptera,' pp. 151-2. Mr. J. N. Halbert, of Dublin, is studying the British Hydrachnidæ, and would be glad of material.

The power of stridulation, so marked a characteristic of certain groups of Dermaptera, and present indeed in most if not all insect orders, occurs also in many Hemiptera, and apparently in all or most waterbugs. The phenomenon, however, still requires considerable investigation.

Stridulation, or the making of certain "musical" sounds, is a term that should apparently be restricted to sounds resultant from two mutually developed interacting surfaces, one of which is the recipient and is usually striated, the other the acting agent and sometimes striated, sometimes consisting of a series of more or less isolated spines or pegs. It may be taken for granted that there must always be *two* specially developed parts of the stridulatory organ, and that these must be interacting and mutually developed. A violin with its bow is a good example (from an insect point of view) of stridulatory apparatus.

The first to call attention to the phenomenon in waterbugs was J. L. Frisch,* who remarks that this species produces with its neck a fiddling noise like the Longicorn beetles. Swinton,† a century and a half later, described the results of his investigations, and declared that he had detected minute *f*-shaped limæ, thickly set with striæ, on the antero-lateral angles of the mesonotum. Handlirsch‡ reinvestigated the whole subject four or five years ago, and ridiculed Swinton, calling the imaginary limæ a "Swintonophone." At the same time, however, Handlirsch discovered on the sixth and seventh abdominal tergites of the male numerous transverse striations which are not present in the female. If these are part of a stridulatory apparatus, the other portion and also the *modus operandi* remain as obscure as in the case of the Corixid strigil, presently to be discussed.

It is usually stated that no openings have yet been discovered to the stink-glands in aquatic Hemiptera, the odour appearing in these insects to be connected with the anal parts.

In *Ilyocoris* this is distinctly tart, and I have discovered a minute single opening (between the posterior coxæ), to which I will recur later on.§

NAUCORIS MACULATA, Fabricius.

The claim of this common European bug to admission to the British lists rests upon a single specimen in Buchanan White's collection at the Perth Museum, labelled "England." There is

* 1727, "Beschreibung von allerley Insecten in Teutschland," vi. p. 32.

† 1877, "On Stridulation in the Hemiptera-Heteroptera" (Ent. Mo. Mag. xiv. pp. 29-31, 2 figs.; and 1880, "Insect Variety," pp. 108 and 203).

‡ 1900, "Neue Beiträge zur Kenntniss der Stridulationsorgane bei den Rhynchoten" (Verh. Zool. bot. Ges. Wien, l. pp. 555-60, figs. 1-7).

§ Leidy (1847, J. Ac. Sci. Philadelphia, n. s. i. 64, mentions a similar opening in the Belostomatidæ.

no reason, apparently, why it should not occur with us, as it is very common in France as near as Paris, and also in Belgium. I have taken it plentifully in South Brittany. As it is a possible British inhabitant, it is now described and figured (fig. 35). It is smaller than *Ilyocoris cimicoides*, greenish testaceous, marked with brown. The pronotum is marked with a distinct, inverted, brown W. The tibiae are longer, less robust, and not so spinose as in the common species. The most marked difference, however, lies in the anterior femora, which are very greatly thickened, and suddenly amplified in a right angle at the base beneath, then narrowed (fig. 36); the pad of hair on the femora is also much smaller, and occurs only near the base. The species, unlike *I. cimicoides*, is dimorphic. While *I. cimicoides* varies from 12–16 millimetres in length, *N. maculata* averages about 10. The brachypterous form was described as a distinct species by Dufour under the name of *Naucoris aptera*.

This bug is the type of the genus, and was described originally by Geoffroy (1762, 'Histoire abrégée des Insectes de Paris,' p. 473, pl. ix. f. 5) as *Naucoris cimicoides*, under the impression that it was Linné's species. There is also a coloured figure in Herrich-Schäffer's 'Wanzenartigen Insecten,' ix. pl. cxciii. f. 899, and detail F. E. D. (1849). It is said by Léon Dufour* to lay its eggs at the end of April in a similar situation to those of *Ilyocoris*. They are obtuse oval, not truncate. Dufour, in the same work, gives much information on the digestive apparatus, sexual glands, &c., of both these genera.

EXPLANATION OF PLATE II.†

- FIG.
 15. *Gerris canaliculatus*, ♂, apical abdominal sternites.
 16. " " ♀, " " "
 17. *G. naiax*, ♂, " " "
 18. " " ♀, " " "
 19. *G. rufoscutellatus*, ♂, " " "
 20. " " ♀, " " "
 21. *G. lateralis*, ♂, " " "
 22. *G. thoracica*, ♂, " " "
 23. " " ♀, " " "
 24. *G. costæ*, ♂, " " "
 25. *G. gibbifera*, ♂, " " "
 26. *G. lacustris*, ♀, " " "
 27. *G. odontogaster*, ♂, apical abdominal segments, viewed from the side.
 28. " " ♀, apical abdominal sternites.
 29. *Ilyocoris cimicoides*, showing articulation of anterior legs.
 30. *Notonecta glauca*, " " " " "

* "Recherches Anatomiques sur les Hémiptères," 1833, Mém. Savants-étrangers Acad. Roy. Sci. France, iv. pp. 349, 413, &c., pl. xvi. figs. 180–2.

† This plate includes "Pl. iii.," mentioned in vol. xxxii. pp. 202–3 (1899). (Figs. 33, 37–44 are omitted.)

34. *Aphelocheirus montandoni*, anterior legs.
 32. " " rostrum, &c.
 31. " " in profile.
 35. *Naucoris maculata*.
 36. " " anterior legs.
 45. *Ilyocoris cimicoides*, " "

(To be continued.)

DRAGONFLY SEASON OF 1904.

By W. J. LUCAS, B.A., F.E.S.

LITTLE of fresh interest has to be recorded in connection with the dragonfly season of 1904. No new species was discovered, and all the critical species, which were known to be really British, but about whose status there was uncertainty, had before this season been re-established.

On April 24th, in the New Forest, I met with the first specimen, an Agrionid, which flew by out of reach; the next day I took three *Pyrrhosoma nymphula*. This early promise, however, was not kept up. The next species seen was *Enallagma cyathigerum*, in small numbers at the Black Pond on Esher Common, and at the same time and place, one of a larger species, probably *Libellula quadrimaculata*, was sighted. On May 29th a male *Agrion puella* was taken near Ashtead. By June 4th this species was plentiful on Bookham Common, where also a larger dragonfly, probably *Libellula depressa*, was seen. The next day, June 5th, *L. quadrimaculata*, *A. puella*, *E. cyathigerum*, and *P. nymphula* were out at the Black Pond, and *Pyrrhosoma tenellum* was apparently just appearing. Till near the beginning of June, therefore, it could scarcely be said that the dragonfly season had commenced in earnest.

At the Black Pond, on June 5th, I found a nymph of *L. quadrimaculata*, from which the imago had just commenced to emerge. It happened to be near the bank, and, though it was tedious and tiring to stoop and watch the process, I stayed till emergence was complete. The nymph was discovered about 11 a.m., and by 11.40 the imago had completely emerged. Out of this time the "rest," with head hanging vertically downwards, lasted nearly or quite half an hour. The "spring-back" was quite sudden, the abdomen being pulled out of the nymph-skin almost immediately afterwards. While hanging at "rest" the lower lip seemed to expand. When an emerging dragonfly hangs head downwards, does it do so to allow of the filling out and expanding of the fore parts?

On June 19th a visit was paid to Frensham Ponds, in Surrey, to test its dragonfly fauna, but unfortunately the day was generally dull and unsuitable. Numbers of *E. cyathigerum* were

found, one *Ischnura elegans*, and one teneral male *Orthetrum cancellatum*. The day was not wasted, however, for a few nymph-skins of the last were discovered, and, as these were little known previously—scarcely at all in Britain—they were at least of equal value with the rather scarce imagines of the same species.

At or near the Black Pond, on June 22nd, one or two *Anax imperator* and one *Cordulia ænea* were seen; this was the only *C. ænea* that I noted during the season. On June 26th, on Esher Common, I caught a male of *L. depressa*, a species of which I met with very few during 1904. On the same day *Pyrrhosoma tenellum* was very numerous at the Black Pond. There also, on July 16th, I took a very nice var. *prænubila* of *L. quadrimaculata*.

Mr. G. T. Porritt again visited the Norfolk Broads in search of *Æschna isosceles*, and the other good dragonflies to be found there in early summer. He met with fair success as regards *isosceles*, and, writing on June 25th, said that he had taken one hawking on land, as *Æ. cyanea* does, when it was nearly dark.

On July 23rd a visit was paid to the Basingstoke Canal, near Byfleet Station, when the species found were the usual ones for that part of the season, though some that should have been there were absent or unnoticed. There were present *Æschna grandis*, *Calopteryx splendens*, *Platynemis pennipes*, *Erythromma najas*, *Ischnura elegans* and its var. *rufescens*, *Agrion pulchellum*, and *Enallagma cyathigerum*.

Some weeks spent in the New Forest revealed little new there. A worn female *Orthetrum cancellatum* was taken on August 1st, and a female *Æschna juncea* on August 9th. A *Calopteryx virgo* was seen as late as September 3rd. On September 2nd *Cordulegaster annulatus* was seen on the wing at Becton Bunny, on the coast, and a female *Æschna cyanea* was caught at Milton.

Wisley Ponds, in Surrey, were visited on September 10th. *Lestes sponsa*, a few *Æschnas*, and *Sympetrum striolatum* were found at the smaller pond, but none of the better species of *Sympetrum* were met with. There was, however, very little sun.

On September 18th an *Æschna juncea* was taken at the Black Pond, where for one or two seasons this species had been seen by me very seldom, if at all.

Mr. F. B. Browne was good enough to give me a female specimen of *Agrion armatum* from the Broads. Of the species he took about ten specimens in the spring, one only being a male.

My last record for the season was *Sympetrum scoticum* and *S. striolatum*, at the Black Pond, on October 9th. The latter, however, probably continued well into November, and not improbably the former may have lasted almost as long.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

(Continued from p. 160.)

Cucullia umbratica.—A few examples in most seasons in June. This species is generally distributed, but nowhere common.

Gonoptera libatrix.—Comes to sugar in September in County Asylum grounds, Grimshaw Lane, Halton, Quernmore, &c.

Abrostola tripartita (urtica).—Comes to sugar and privet-bloom in July; Arnside, Witherslack, Methop, and Lancaster (generally).

A. triplasia.—Not plentiful; comes to sugar and bloom in August, and is generally distributed throughout the district.

Plusia chrysis.—Common about Methop and Witherslack, less so at Arnside and Hest Bank, not common about Lancaster, in July.

P. festuca.—Scarce and local; near Heysham in September. "I used to take the larvæ and pupæ of this species commonly near Heysham some years ago" (G. L.).

P. iota.—Odd specimens come to bloom in June and July; nowhere common, but generally distributed.

P. pulchrina.—Comes to cultivated flowers at dusk in late June in the County Asylum grounds, and I have also taken examples near Halton, Quernmore, Arnside, Witherslack, Methop, &c.

P. gamma.—Comes freely to bloom in August and September, and I have seen worn (hybernated) examples in early June. It is common and generally distributed.

P. interrogationis.—Local; I have only taken this species on the moors near Clougha Pike in June.

Anarta myrtili.—Common on all the moors and mosses, as at Clougha, Witherslack, Methop, &c., in June, July, and August.

Heliaca tenebrata (arbuti).—Local; near Hornby, Deep Cutting Bridge, and between Torrisholm and the river Lune. The imago appears in May.

Phytometra viridaria (ænea).—Local, but common near Clougha in June, occasionally at Arnside, Witherslack, &c.

Euclidia mi.—Generally distributed; common near Clougha in June; I have found the larvæ feeding upon yellow melilot (*Trifolium procumbens*) in August.

E. glyphica.—Local; near Carnforth and Galgate on the L. & N. W. Railway batters. The larvæ feed upon *Trifolium repens* (Dutch or white clover). The moth flies in the sunshine in late May and June.

Rivula sericealis.—Occurs at Witherslack in early July.

Zanclognatha grisealis.—Fairly common near Clougha, Blea Tarn, Arnside, and in the County Asylum grounds in June and July.

Z. tarsipennalis.—Uncommon; at Arnside, Heysham, and County Asylum grounds in June and July.

Hypona proboscidalis.—Common in most of the lanes among nettles (*Urtica dioica*) in July.

Tholomiges turfosalis.—Local; I have only taken specimens near Clougha in July.

Brephos parthenias.—I have only bred specimens from Witherslack larvæ. "Common on Methop and Witherslack Mosses in March and early April" (G. L.).

GEOMETRIDÆ.

Urapteryx sambucaria.—Common and generally distributed in July and August.

Epione apiciaria.—I took a specimen in the County Asylum grounds in July, 1900; at Witherslack it is local, and not uncommon in one locality near Methop. The moth flies late at night at the end of July and beginning of August.

Rumia luteolata (*cratagata*).—Abundant everywhere throughout the summer months.

Venilia macularia (*maculata*).—Fairly common near Carnforth on the L. & N. W. Railway batters. The moth flies in June.

Metrocampa margaritaria.—Fairly common in Grimshaw Lane, County Asylum grounds, Blea Tarn, &c., in July. Abundant in Arnside.

Ellopia prosapiaria (*fasciaria*).—Common at Arnside in July.

Eurymene dolabraria.—Local and uncommon; Corporation Wood, Quernmore, County Asylum grounds, Arnside, and Witherslack, in June.

Hygrochroa (*Pericallia*) *syringaria*.—"Local, near Hornby in July" (G. L.).

Selenia bilunaria (*illunaria*).—Fairly common and generally distributed in April and July.

S. lunaria.—A male specimen taken at Warton, near Carnforth, on June 8th, 1905.

Odontopera bidentata.—Common in Grimshaw Lane, Corporation Wood, County Asylum grounds, Blea Tarn, &c., in May.

Crocallis elinguaris.—Common and generally distributed in July and August.

Ennomos (*Eugonia*) *alniaria* (*tiliaria*).—Comes freely to light in August, and is common about Quernmore, Blea Tarn, &c.

E. quercinaria (*angularis*).—Occurs about Methop and Witherslack in September and October.

Himera pennaria.—Comes freely to light in September and October at Blea Tarn, Quernmore, County Asylum grounds, &c. This species is subject to considerable variation—from light brown to rich rufous red, in colour, and some specimens are strongly suffused with black scales.

Phigalia pedaria (*pilosaria*).—Common in Corporation Wood, Quernmore, County Asylum grounds, Blea Tarn, &c., on the tree-trunks in March; also comes freely to the street-lamps. We get a fine dark unicolorous grey variety of this species in the first-named locality.

Amphidasys strataria (*prodromaria*).—Uncommon; I have bred examples from Methop larvæ taken in July. "It occurs sparingly in Corporation Wood, Quernmore" (G. L.).

A. betularia.—I have bred both the type and var. *doubledayaria* from Methop and Witherslack larvæ taken from birch in September. I have only taken specimens on the wing near Lancaster on three occasions—near Rush-a-lee in June—and these have all been the black variety.

Hemerophila abruptaria.—Comes to light in May in several localities in the district, but nowhere plentiful.

Boarmia repandata.—Occurs in June and July at Arnside, Methop, near Clougha, Corporation Wood, &c.

B. gemmaria (rhomboidaria).—Common throughout the district in June and July.

B. roboraria.—Local and scarce. "Corporation and Quernmore Woods in June" (G. L.).

B. consortaria.—Local and scarce. "Corporation and Quernmore Woods in June" (G. L.).

Tephrosia consonaria.—Local. Witherslack and Quernmore at the end of May. The imago may be found sitting on the fir-tree trunks.

T. crepuscularia.—Corporation Wood and near Methop in April.

T. biundularia.—I have bred some fine dark forms of this species from Methop larvæ beaten from birch and oak-trees in June. "Corporation Wood in April" (G. L.).

Gnophos obscuraria.—Local; at Methop and Witherslack in July.

Cabera pusaria.—Plentiful everywhere in July and August.

C. exanthemaria.—Occurs abundantly in nearly every locality in July and August.

Bapta tenerata.—Fairly common at Arnside (on the Knott), Witherslack, Methop, &c., in June.

Macaria notata.—Local; this species occurs at Arnside in June, but is not common.

M. liturata.—Fairly common in the fir-woods at Arnside, Grange, and Methop in July.

Halia vauaria (wavaria).—Generally distributed, and common in July.

Strenia clathrata.—Local; near Warton, on the L. & N.W. Railway batters, in May and early June.

Penagra petriaria.—Common at Clougha, Quernmore, &c., in June.

Numeria pulveraria.—Not common; occurs at Arnside, Methop, and Witherslack in April and May.

Scodiona belgiaria.—Fairly common at Witherslack; less so and very local near Clougha in June.

Selidosema ericetaria (plumaria).—Fairly common on the Witherslack mosses in July.

Ematurga atomaria.—Abundant on the mosses at Witherslack, Methop, Heysham, &c., and on the moors at Clougha and Quernmore from May to August.

Bupalus piniaria.—Common at Grange, Methop, Arnside, and Quernmore, in the fir-woods in June. Our form has a white ground colour.

Perconia (Aspilates) strigillaria.—Plentiful on Methop and Witherslack Mosses; less common at Heysham in June.

Abraxas grossulariata.—Abundant everywhere in lanes and gardens in July and August. This species is subject to great variation; I have forms bred from larvæ found near Warton on blackthorn (*Prunus spinosa*) which are very dark, with coalesced spots, and others from Grimshaw Lane, very light with few spots.

A. sylvestra (ulmata).—Local; near Halton and Methop and about Yealand. The moth is on the wing in June and July.

- Generally distributed and fairly common in June and July.
- via*.—Abundant about hedgerows in February
- Fairly common in Aqueduct Wood, Quernmore, Farn, &c., in February and March.
- Generally distributed; Arnside, Witherslack, Asylum grounds, &c., in late October.
- (*progemmaria*).—Generally distributed and very to light freely in February and March.
- Fairly plentiful and generally distributed in October.
- æscularia*.—Local; Aqueduct Wood and near Clougha
- ia brumata*.—Plentiful about hedgerows, and comes freely October, November, and December.
- ia*.—Generally distributed, and comes freely to light in
- ia dilutata*.—Generally distributed, and common everywhere, October.
- ligigrammaria*.—Uncommon. I have only taken this species on moors near Clougha in August.
- rentia didymata*.—Abundant in Grimshaw Lane, County Asylum grounds, Clougha, &c., in July.
- L. multistrigaria*.—Not common; near Blea Tarn, Clougha, Rush-see, &c., in April and May.
- L. cæsiata*.—Abundant on the rocks about Clougha in July.
- L. flavicinctata*.—I have only taken this species about Clougha—where it is scarce—in July.
- L. saicata*.—Generally distributed; Silverdale, Blea Tarn, Clougha, &c., in August.
- L. olivata*.—Fairly common at Witherslack and Arnside; not common near Clougha in July.
- L. viridaria (pectinitaria)*.—Generally distributed and common in July.
- Emmelesia affinitata (rivulata)*.—Fairly common about Lancaster, Blea Tarn, Arnside, Witherslack, &c., in July.
- E. alchemillata*.—Local; near the County Asylum and at Witherslack in July.
- E. albulata*.—Fairly common; Clougha, Grimshaw Lane, &c., in June.
- E. decolorata*.—Fairly common and generally distributed in June.
- E. taniata*.—Local; near Arnside and Silverdale in early July.
- Tephroclystia (Eupithecia) venosata*.—Uncommon; near Witherslack and at Arnside in June.
- T. (E.) linariata*.—Local; near Witherslack in June.
- T. (E.) pulchellata*.—Occasionally in Grimshaw Lane, at Arnside and Silverdale in June.
- T. (E.) castigata*.—Fairly common at Witherslack and near Methop Bank in July.
- T. (E.) virgaureata*.—Not common; occasionally near Methop in early June.
- T. (E.) constrictata*.—Local at Witherslack in early July.

T. (E.) nanata.—Fairly common at Clougha, Quernmore, &c., in May and June.

T. (E.) vulgata.—Fairly common near Clougha, Grimshaw Lane, &c., in June.

T. (E.) minutata.—Common near Clougha, Witherslack, &c., in June.

T. (E.) abbreviata.—I have only bred this species from larvæ beaten from oak near Clougha in June. The moth appears in April.

T. (E.) exigua.—Common about hedgerows of whitethorn in June.

T. (E.) sobrinata.—Common at Warton, Witherslack, and Arnside about juniper (*Juniperus communis*) in July.

Chloroclystis (E.) rectangulata.—Common at Witherslack, County Asylum grounds, &c. The larvæ feed in the buds of pear and apple-trees in May; the moth appears in June.

Lobophora carpinata (lobulata).—Common in Corporation Wood, Quernmore, in April.

L. polycommata.—Local, I have only taken this species near Methop in May.

Thera juniperata.—Local. "Near Warton about junipers in October" (G. L.)

T. simulata.—Arnside in August.

T. variata.—Local. I have only taken this species in a fir-wood near Quernmore in late May and early June.

Hypsipetes sordidata (elutata).—Abundant everywhere; very variable in colour and markings. Some of the moorland forms—near Clougha—are very beautiful.

Melanthia bicolorata (rubiginata).—Local. I have only taken specimens in the County Asylum grounds in July.

M. ocellata.—Generally distributed throughout the district in July.

M. albicillata.—Common near Warton; less so at Witherslack, Lancaster, and Halton, in late June.

Melanippe hastata.—"Scarce at Witherslack in June" (G. L.)

M. tristata.—Local, but common near Clougha in June.

M. sociata (subtristata).—Abundant everywhere in May and July.

M. montanata.—Abundant throughout the district in June and July.

M. galiata.—I took this species in June, 1904, for the first time, in Grimshaw Lane; probably overlooked previously for *montanata*.

M. fluctuata.—Abundant on walls, &c., in July and August.

Anticlea badiata.—Fairly common in the County Asylum grounds near Blea Tarn, Quernmore, &c., in May.

A. nigrofasciaria.—Not common: Arnside, Witherslack, Lancaster in April.

Coremia designata.—Uncommon; Quernmore, Witherslack, &c., in July.

C. ferrugata.—Common everywhere in May and August.

C. unidentaria.—Less common than the preceding species; Blea Tarn, Quernmore, County Asylum grounds, &c., in August.

Campptogramma bilineata.—Abundant at Heysham, Arnside, Halton, &c., in July. This species shows considerable variation.

Phibalapteryx vitalbata.—Local; at Witherslack and near Methop in July and August.

Triphosa dubitata.—Common at Witherslack and Lower Kellet comes freely to ragwort flowers in August and September.

Eucosmia undulata.—Local; I have only bred this species from Methop and Witherslack larvæ taken in September. The moth appears in June.

Cidaria siderata (*psittacata*).—Not common. "Witherslack and Methop in October. This species comes to ivy-bloom" (G. L.)

C. miata.—"Not plentiful in Witherslack in October at ivy-bloom" (G. L.)

C. corylata.—I have bred this species from larvæ beaten from blackthorn (*Prunus spinosa*) in Grimshaw Lane. Fairly common at Witherslack in June.

C. truncata (*russata*).—Fairly common about hedgerows in Grimshaw Lane, Rush-a-lee, Halton, Arnside, &c., in August.

(To be continued.)

NOTES AND OBSERVATIONS.

EXOTIC EARWIGS WANTED.—I am preparing a revision and monograph of the Dermaptera or Forficularia of the world, and would very gladly receive any material for examination, especially from Australia, China, and Central and South Africa.—MALCOLM BURE; 23, Blomfield Court, Maida Vale, W., June 24th, 1905.

OVA OF BUTTERFLIES WANTED.—I should be greatly obliged to anyone who would kindly give or lend me the ovum of any of our butterflies, except those mentioned below, for the purpose of figuring. Micro-photographs, or ordinary photographs if the object is clear and well-defined, would be useful. Species of which the ovum has been figured:—*Euchloë cardamines*, *Gonepteryx rhamni*, *Argynnis euphrosyne*, *Vanessa urtica*, *Pararge aegeria*, *P. megara*, *Cænonympha pamphilus*, *Callophrys* (*Thecla*) *rubi*, *Chrysophanus phleas*, *Lycæna icarus*, *L. bellargus*, *Hesperia malva*, *Thanaos tages*.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

NOTE ON ZANCLOGNATHA GRISEALIS.—Barrett (vol. vi. p. 300) throws doubt on a remark of Buckler to the effect that *Z. grisealis* passes the winter in the pupal state. I beat three or four larvæ of this species from oak in August last; they all pupated in September, and emerged end of May to June.—H. V. PLUM; Epsom College, June 7th, 1905.

LARVA OF THECLA RUBI ON DOGWOOD.—Early in July last I beat from dogwood some half-dozen larvæ of what I thought at the time were *Lycæna argiolus*; they fed well on the berries, quite ignoring the leaves; in due course they pupated, and last month produced fine specimens of *Thecla rubi*. Is not this an unrecorded food-plant for this species?—E. C. JOY; 34, Fairholt Road, Stoke Newington, N.

ABERRATION OF EUCHELIA JACOBÆÆ.—At Warton, on June 8th, I boxed a fine aberration of *Euchelia jacobææ*. The specimen, which is a female, has the fore wings rosy red, with a shaded black central band. The left fore wing is slightly rubbed, otherwise the example is in fine condition. She had deposited a batch of ova when I reached home at night.—C. H. FORSYTHE; The County Asylum, Lancaster.

CAPTURES AND FIELD REPORTS.

DEILEPHILA LIVORNICA IN GLOUCESTER, 1905.—Last year I reported the capture of one specimen of this species, which was subsequently notified from many other localities widely separated. This year I was shown another specimen caught in the yard of some ironworks here by one of the workmen, and given to a friend of mine. I notice in the current number of the 'Entomologist' that the species has already been noticed from other districts again, so that it appears likely that *D. livornica* may become firmly established with us.—A. LIONEL CLARKE; Gloucester, June 1st, 1905.

CERURA BICUSPIS IN LANCASHIRE.—At Haverthwaite Moss, on June 9th, I took a male specimen of *Cerura bicuspis* at rest on a birch twig. It was in the finest condition. — C. H. FORSYTHE; The County Asylum, Lancaster.

SELENIA LUNARIA IN THE LANCASTER DISTRICT. — While collecting at Warton, near Carnforth, on June 8th, I took a male example of *Selenia lunaria*. This species is new to me in this district.—C. H. FORSYTHE; The County Asylum, Lancaster.

NOTES FROM AUSTRALIA.—I have recently spent a short holiday in Southern Queensland after insects, and doubtless some short account would be of interest to readers of the 'Entomologist.' Leaving Wellington on Dec. 24th, 1904, by the s.s. 'Wimmera,' we had a pleasant run across to Sydney, which was reached the following Wednesday morning. Here, whilst waiting for the northern train, I took a walk in the beautiful Botanical Gardens, where I noticed *Papilio sarpedon*, *Vanessa kershawii*, and several small *Lycenidæ*; also several examples of the beetle *Anoplognathus pectoralis* lying dead on the paths. The run north is mostly through open country, with gum-trees scattered sparingly about. The following day I reached Warwick, on the Darling Downs, where I stayed a day or two. Here a large dark *Papilio* (*P. egæjeus*) was fairly common, and was especially fond of coming into the shade under the balconies. The male of this insect was difficult to catch when in good condition, although its flight was generally slow and floppy. I also obtained *P. sthenelus*, *Acræa andromache*, *Terias smilax*, *Junonia veleda*, and the beautiful *Talmenes evajous*. I next went on to Brisbane, where *Papilio sarpedon* was very common, and almost impossible to catch. Here I obtained a beautiful example of *Charaxes sempronius*. There is very little to be done just around Brisbane, although a fair number of beetles are to be obtained about the electric lights at the railway station. One day I visited the coast, but insects (except mosquitoes) were very scarce: a few *Euploes* and *Danaïs archippus* and *D. affinis* were our only captures. I then decided to go on to Eumundi, about seventy miles further north, which is in a belt of dense tropical scrub which occurs here. This country is entirely different to that through which I had recently passed, and consisted of figs, palms, and climbing plants; whilst many of the trees supported epiphytes and parasites, amongst which were a few orchids and the handsome stag-horn fern. Here I found many more insects, amongst which were

Papilio capaneus and *P. leosthenes* (somewhat worn), *Hypocysta metirius*, *Danaus taygetus*, and a curious butterfly with a beautiful leaf-like under side (*Dolichochalia australis*), which was fond of taking short flights and then returning to some favourite perch; but my finest capture was a male (unfortunately slightly chipped) of the magnificent *Ornithoptera richmondii*. This latter was fairly common round a group of trees bearing a white flower very like orange-blossom, but seldom descended within reach of the net. I also obtained a fair number of Coleoptera, including some very rare species, and one or two fine Longicorns which seem to be unknown. I then returned south, again staying a few days at Warwick, where I now found *Charaxes sempronius* fairly common, and managed to capture three more examples. The weather, which during the first part of my trip had been very hot (about 103° or 104° in the shade), had now become much cooler (80° or 85° in the shade), and the sky had clouded over, so that few insects were obtainable whilst here. The previous hot dry weather had had a very unfavourable effect upon both beetles and butterflies, a very large number of the latter being worn, whilst both were scarce. After a pleasant run across from Sydney, I arrived in Wellington Jan. 18th, having had a most enjoyable holiday. I may add that immense numbers of locusts occurred everywhere, many of them with very beautiful under wings, especially one brilliant yellow one on the Darling Downs.—HUBERT W. SIMMONDS; 17, Aurora Terrace, Wellington, N.Z., March 23rd, 1905.

NOTES FROM THE CHESTER DISTRICT FOR 1904 (concluded from p. 165).

Aplecta nebulosa.—From June 8th to the 18th twenty-three moths were reared from black parents with grey fringes (var. *robsoni*, Collins). Four were of the type-form, five were intermediate between the type and var. *robsoni*, ten were *robsoni*, and four were the form *thompsoni* (Arkle)—that is, jet-black, with white margins and white fringes. Another typical specimen emerged on the 29th—total, twenty-four insects. From twelve larvæ from type parents twelve moths emerged, June 14th to June 27th. Eleven were typical, and the twelfth an intermediate between vars. *robsoni* and *thompsoni*. The curious thing is that the black forms were, as a rule, the first to appear. All my larvæ were kept in a couple of breeding-cages, with plenty of moss at the bottom for them to hide in by day. They began to wander about the cages early in January, occasionally eating, very sparingly, of dock or dried swallow-leaves up to March, when they began actively feeding on dock. The larvæ prefer spinning up in dry moss. All were kept in a cold outhouse, with plenty of ventilation. A number of larvæ from *thompsoni* parents are now (February, 1905) showing themselves after their short hybernation. The chief object is to see if the white margins will be increased in the resultant moths. It has been found that the variety *robsoni* may occur at the rate of ten per cent. from wild Delamere larvæ, and the form *thompsoni* in the proportion of three per cent.; therefore, although the chances are at present small, the result, whatever it may be, with reference to the white margins, may occur in nature. In fact, I should not be surprised if one or other of these forms of *A. nebulosa* ultimately supplants the type, as in the case of *Amphidasys betularia*. At any rate, it is significant that melanism has already been referred to, in the Chester district, as

being "rampant." Whatever be the cause, it cannot be attributed to smoke, and there are those who claim that we have not an excess of moisture.

Boarmia repandata.—The larvæ mentioned (Entom. xxxvii. 74) from mid-Northumberland were kept through the winter, as in the case of *A. nebulosa*, but in flower-pots covered with gauze. They did well until March, when they nearly all died off, and I only reared nine moths (June 8th to June 18th), but beautiful specimens, well marked, blotched, and dusted with brown-black on a grey ground—four males and five females. The larvæ showed signs of awakening from hibernation on February 22nd, swaying to right and left, but not relaxing hold of the withered saw-wood-leaves and twigs, which they grasped by their anal claspers. Like *A. nebulosa*, they are night-feeders, and prefer to spin up in dry moss.

Abraxas grossulariata.—I had two dozen black larvæ, but the moths reared were as typical as they well could be.

Amphidasys betularia.—A dozen of the green form of the larva, taken in Delamere Forest, all produced the black variety of the moth (*doubledayaria*); in fact, we appear to get the black form of this species.

Odontopera bidentata.—Common in Delamere Forest, on Scotch fir, in September and October. The pine-feeding *bidentata* are very unlike the smooth light brown larvæ found earlier on birch; they are rougher, with tubercles. They vary in colour—sooty black, ochreous brown, with dorsal diamond pattern, and reddish or dark green patches. The moths reared from these pine-feeders show a marked tendency towards melanism. I have a sooty brown, almost black, specimen.

Bupalus piniaria.—Plentiful on Scotch fir, Delamere Forest, in September and October. On October 1st I took an example of the yellowish olive-green form.

Thera firmata and *Ellopiæ prosapiaria*=*fasciaria*.—Very common on Scotch fir, Delamere Forest, in September and October. They are then very small, and hibernate on the branches among the foliage, but are difficult to bring through the winter in confinement. They are best obtained after hibernation, in April, although their numbers are then apparently thinned.

Macaria liturata.—Fairly common in Delamere Forest, on Scotch fir, in September and October. The usual colour is green, with whitish yellow lines and stripes and reddish head. The last mentioned feature easily separates the species from the other pine-feeders; but there is a variety almost as common as the type, to the discovery of which I am indebted to my friend Mr. J. Thompson, of Chester. Some three or four years ago, to prove their identity, he placed twelve in a flower-pot by themselves. The results were nine dark imagoes (var. *nigrofulvata*, Collins); two types and the remaining pupa died. The following is a description of this variety of the larva:—Pale pinkish grey or brownish, green entirely absent. Head dark purplish black-brown, almost black. Lines and stripes as in the green form but paler grey than the general colour of the caterpillar. The side stripes are interrupted by triangular patches of dark purplish brown. The dorsal segment divisions are the same dark purplish brown. Legs and claspers brown.

Dragonflies:—There was no appreciable diminution in the numbers of the district species, except in the case of *Æschna grandis*. Why this dragonfly should have been comparatively scarce it is difficult to say.—J. ARKLE; Chester, Feb. 17th, 1905.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 7th, 1905. — Mr. F. Merrifield, President, in the chair. — Herr Ludvig von Gangelbauer, of the Vienna Museum, was elected an Honorary Fellow; and Mr. Charles J. Grist, of "Apsley," Banstead, Surrey; Mr. Vernon Parry Kitchen, of the Priory, Watford, Herts; and the Rev. W. Mansell Merry, M.A., of St. Michael's, Oxford, were elected a Fellows of the Society. — Mr. M. Burr exhibited an earwig, *Apterygida arachidis*, Yers., found by Mr. Annandale, of Calcutta, in a box of specimens received from the Andaman Islands. When placed in a small box, it was alone, but next morning there were five larvæ present; two disappeared, apparently being consumed by the parent; and the remaining three were those exhibited. — Mr. Burr also showed a locustid of the family Pseudophyllidæ from Queensland, taken among twigs and plants which it greatly resembled, together with a photograph of the insect in its natural position.—Mr. E. C. Bedwell showed three examples of *Gnorimus nobilis*, L., taken at Woolwich; and a malformed specimen of *Lochmæa suturalis* which had the left posterior tibia bifid for about one-third of its length, and two tarsi, one of which had the joints considerably enlarged.—Mr. O. E. Janson brought for exhibition a living specimen of *Omophlus betulae*, Herbst, a beetle not known to occur in Britain, found by his son near Covent Garden, and probably imported.—Mr. W. J. Lucas exhibited one male and three females of *Agrion armatum* taken this year by Mr. F. Balfour Browne, and sent to him alive.—Mr. G. C. Champion showed four specimens of the rare *Acrognathus mandibularis*, Gyll., captured on the wing towards sunset near Woking at the end of May.—Mr. Selwyn Image exhibited two aberrations of *Biston hirtaria*, Cl., both females, taken at rest on tree-trunks at Mortehoe, North Devon, April 23rd, 1905. The first aberration was tolerably normal in general coloration, but the anterior half of the fore wings was much suffused with fuscous, and at the costa broadly emphasized with rich black. The second aberration was semi-transparent black all over both fore and hind wings, the veins strongly delineated with black, powdered with ochreous.—Mr. W. J. Kaye showed a number of empty pupa-cases of *Zonosoma pendularia* to demonstrate the wide variation of methods in the placing of the silken girth round the pupa.—Professor E. B. Poulton, F.R.S., exhibited leaves of strawberry, *Berberis japonica*, and cherry-laurel, which had been sent to him by Mr. W. B. Grove, of Handsworth, Birmingham. The leaves had been attacked by a minute fungus, which, in the case of the *Berberis*, had been identified by Prof. S. H. Vines, F.R.S., as *Phyllosticta japonica*, Thnëm. The attack was local, and followed by the death and disappearance of the central portion of the leaf-tissue of each patch, leaving a roundish or oval

window outlined with brown, sometimes in the form of a narrow line, sometimes spreading peripherally into the leaf for a greater or less distance. In the strawberry leaves the edges of the windows were somewhat ragged, but those of the other two leaves had smooth contours and strikingly resembled the oval transparent areas upon the fore wings of *Kallima inachis*, *paralekta*, &c.—surrounded most conspicuously with a marginal zone of modified colour varying greatly in tint and in extent in different individuals. Professor Poulton had believed that these “windows” of *Kallima* represented holes gnawed by larvæ, and that the altered marginal zone reproduced the effect of the attacks of fungi entering along the freshly exposed tissues of the edge. But he now desired to withdraw his earlier hypothesis in favour of the more probable and convincing suggestion made by Mr. Grove.—Professor Poulton also showed a photograph of the fungus-like marks on the wings of the Oriental Kallimas prepared under his direction by Mr. Alfred Robinson, of the Oxford University Museum. — Dr. Karl Jordan communicated a note upon the variability of the genitalia in Lepidoptera.—Dr. G. B. Longstaff detailed his observations on scents in the male of *Gonepteryx*, and mentioned that whereas in the male *G. cleopatra*, the odour was strong, he had been unable to detect any appreciable fragrance in *G. rhamni*. Such a difference, he said, seemed to imply a physiological difference of the two forms pointing to specific distinction.—Dr. F. A. Dixey, in connection with Dr. Longstaff's observations, exhibited the several forms of *Gonepteryx* occurring in the palæarctic region, and demonstrated the variation of wing coloration in the respective forms ranked as species.—Mr. H. J. Elwes, F.R.S., read a note on the geographical affinities of Japanese butterflies, numerous examples of which, taken by himself, he also exhibited. Summing up his remarks, he said that during the winter and spring months the plants and insects of Japan were, like the climate, palæarctic in character, yet during the summer and autumn they were tropical.—Professor Christopher Aurivillius communicated a paper on “New African Lasiocampidæ in the British Museum.”—Mr. G. W. Kirkaldy communicated a “Mémorial on the Rhynchota taken by Dr. Wyllie chiefly in Beira and Lifù.”—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 11th.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Bevins, of Ongar, Essex, was elected a member.—Mr. Sich exhibited the flowering spike of an asphodel which had grown in a sheltered position in his garden at Chiswick. It originally came from the West of France, but Dr. Chapman said it was not the same species which formed the pabulum of *Hastula hyerana* in the Esterels.—Mr. R. Adkin, the lantoscope recently brought out by Dr. Connold to facilitate the examination of lantern-slides.—Mr. F. Noad Clark, an old work on Microscopy, dated 1771, ‘Micrographia Illustrum,’ by Geo. Adams, and called attention to the curious illustrations.—Dr. Chapman, a short series of a moth, *Metoptria monogramma*, allied to *Euclidia glyphica*. They were taken in Sicily at the end of April.—Mr. Main, enormous larvæ in spirits from the West Coast of Africa, probably of some large species of Longicorn.—Mr. Lucas, the delicate

and beautiful Entomostrakon, *Branchipus stagnalis*, taken on May 10th from a cart-rut of water at Claygate. It is generally rare in this country.—Mr. Gilbert J. Arrow, various species of Coleoptera to illustrate an address which he afterwards gave, entitled "Some Social Beetles." A discussion took place as to the use of sound apparatus in larvæ, the suggestion being that they were more or less directly protective.

May 25th. — The President in the chair. — Messrs. Harrison and Main exhibited a large number of species of Lepidoptera captured or bred this season, comparing those from South of England localities with those from the neighbourhood of Liverpool.—Mr. Carr, series of spring Lepidoptera from the New Forest.—Mr. Joy, a short bred series of *Thecla rubi* from Folkestone, the larvæ of which fed on dogwood, which had led him to think they were *Cyaniris argiolus*. — Mr. Hy. J. Turner, a short series of *Cucullia lychnitis*, bred from larvæ taken at Box Hill in June, 1904. The larvæ were fed up in the hottest sunshine in a conservatory, and grew extremely fast. When found they were studded with ova of ichneumons, but after considerable trouble these were successfully removed. He also showed larvæ of *Leioptilus septodactylus* (*lienigianus*), a local plume moth, feeding on *Artemisia vulgaris*. They were found at Croydon feeding in the open. — Mr. Edwards, specimens of the *Amphioxus*, and read notes on their structure, position in nature, and habitat. — Dr. Chapman, a series of *Depressaria thapsiella*, bred by him from larvæ obtained in Sicily, where it fed in countless numbers on *Thapsia gargania*. — Mr. Sich, larvæ and pupæ of *Acipitilia spilodactyla* from the Isle of Wight, feeding on *Marrubium vulgare*. — Mr. Wright, a larva of a large species of Coleoptera feeding in the wood of a sugar-box from the West Indies.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The fourth ordinary meeting of the Session was held in the Royal Institution, Liverpool, on April 17th, Mr. Rd. Wilding, Vice-President, in the chair. — Drs. Wm. Bell, J.P., of Rutland House, New Brighton, and P. F. Tinne, of Mostyn, Aigburth, were elected members of the Society. An invitation to exhibit at the meeting of the Liverpool Microscopical Society to be held on May 5th was accepted with thanks, the following amongst others promising to represent the Society :—Miss Birch, and Messrs. F. N. Pierce, F.E.S., H. B. Prince, H. B. Score, F.R.G.S., Rd. Wilding, and E. J. B. Sopp, F.R.Met.S. Donations to the library were received from Professor T. Hudson Beare, B.Sc., F.E.S., and Messrs. Score and Sopp; and a donation to the micro-slide cabinet from Mr. C. M. Adams, F.I.C. — The paper of the evening was by Dr. Geo. E. J. Crallan, M.A., F.S.A., of Bournemouth, "On the Life-history of *Ophiodes* (*Pseudophia*) *lunaris*," which was illustrated with beautiful coloured figures by the author, including the egg in three stages (actual size and magnified thirty-two diameters), the larva in six stages, imago, upper and under side of both sexes, &c. In opening, Dr. Crallan referred to the fact that this is the only species of the genus that has occurred in Britain, the first specimen having been taken in Hampshire in 1882, and several having occurred since. In Spain it is said to be common in the cork woods, and in Austria occurs amongst oaks. In

confinement the moth appears from April to June from eggs laid on oak or poplar; when laid the egg is of a beautiful green colour, but after a week the colour changes to red or plum, and still later to drab. The changes in colour and appearance of the larva at the different ecdyses were graphically described, and much interesting information given on habits throughout the life of the insect in all its stages. On the motion of the chairman a very cordial vote of thanks was accorded Dr. Crallan for his valuable contribution to our knowledge of the life-history of this rare British moth.—Among exhibits shown were a box of insects from Trinidad, exhibited by Miss Birch on behalf of her brother; eggs of *T. opima* on hawkweed by Mr. H. B. Prince, and on yarrow by Mr. Mollinson, who also showed larvæ of *L. litoralis*; *Plusia moneta* (bred) and *Lycæna arion* from S. Devon, by Mr. Pierce; and a queen wasp in a state of hybernation, by Mr. Score. — E. J. B. SOPP and W. D. HARRISON, *Hon. Secretaries*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — *April 10th.* — Mr. G. T. Bethune-Baker, President, in the chair. — Mr. E. C. Rossiter was elected a member of the Society. — Mr. J. T. Fountain gave an account of some work he had been doing, which showed how much collecting might be done in the winter. On December 2nd he saw at Sutton more moths than he had ever seen before, chiefly *Cheimatobia brumata*, L., but including also *Scopelosoma satellitia*, L., and *Orrhodia vaccinii*, L. On March 4th he sugared at Chelmsley Woods, and the last two species came in numbers.—Mr. W. E. Collinge showed Collembola; *Sminthurus malngreni*, Tulbb., from Knowle, a species new to England; and *Lipura ambulans*, L., from Solihull, where it occurred in thousands in connection with some cauliflowers suffering from finger-and-toe disease.—Mr. Gilbert Smith gave an account of the coleopterous genera *Eriocephalus* and *Aseum*, illustrating it by drawings and specimens of the species in various stages.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society. 1904-5. Pp. i-xvi, 1-104. The Society's Room, Hibernia Chambers, S.E. 1905.

CONTAINS several interesting contributions on entomological subjects, the most important perhaps being a paper on the genus *Coleophora* by Mr. Alfred Sich, F.E.S. In his address the President (Mr. Sich) first reviews the principal events of the year, so far as these concern the British Fauna; he then discourses on "the joy of animal existence" and the triumph of animal life.

Several field-meetings were held during the year, and reports of these are given. That referring to the Eynsford meeting is accompanied by a capital map of the district.

THE ENTOMOLOGIST

VOL. XXXVIII.]

AUGUST, 1905.

[No. 507.]

DESCRIPTION OF *LYCÆNA ARION* PUPA, ♂.

By F. W. FROHAWK, M.B.O.U., F.E.S.



While collecting on July 12th, in company with Mr. A. L. Rayward, in Cornwall, we determined on a systematic search for the pupa of *Lycæna arion*, and were rewarded by the discovery of a living pupa, of which I have the pleasure of giving the following description and above figures.

It bears a general affinity to the pupa of *L. ægon*, excepting its much larger size, measuring half an inch long.

FIG. 1.—DORSAL VIEW. Across the middle its greatest diameter is $\frac{3}{14}$ in. The head is obtuse, base of wings slightly angular and swollen, wing slightly concaved, abdomen swollen at third and fourth segments, then attenuating and rounded posteriorly. FIG. 2.—SIDE VIEW. It measures $\frac{3}{16}$ in. across the middle, the head rounded, thorax convex rising into a slight dorsal ridge, meta-thorax and first abdominal segment sunken, abdomen swollen at the middle and curving to posterior segments which are rounded; anal segment is compressed to ventral surface, cremastral hooks absent; wing ample, swollen, and rounded across the middle and extending to the fifth abdominal segment.

The entire surface is minutely granulated and covered with very fine reticulations of a deep amber colour; spiracles are prominent and

blackish, the surface posteriorly adjoining them is beset with a number of shining raised bead-like processes, some bearing minute amber-coloured spines, which have the apical half branched with extremely small bristles.

The colour when first found was uniformly ochreous, with the eyes dark leaden grey; it gradually turned darker on the head, thorax, and abdomen; the wings remained ochreous, but showed leaden-grey hind margins; then the median wing-spots appeared, and soon the whole pupa began to deepen more uniformly, until it assumed a deep leaden-grey all over, and remained unchanged for over thirty hours; finally a perfect male emerged at 8.30 a.m. July 16th.

With the interesting discovery of this hitherto unknown pupa Mr. A. L. Rayward's name must be coupled, for we had the joint pleasure of not only finding the living pupa, but also, in close proximity, a pupa-case of a freshly emerged female, which my friend detected at rest, and which paved the way to our success.

DESCRIPTION OF A NEW SPECIES OF ARADIDÆ FROM CEYLON.

By W. L. DISTANT.

THE following description refers to a species which I received from my ever-helpful friend Mr. E. E. Green, subsequent to my dealing with the Aradidæ in the Rhynchota of British India, and which, for that wide area, constitutes the second known species of *Aneuris*.

ANEURIS GREENI, sp. n.

Head, pronotum, scutellum, and sternum, black; abdomen, apex of head, coxæ, and apices of tibiæ piceous-brown; tarsi ochraceous; corium stramineous, its base black, its apex and longitudinal veins very dark fuscous; membrane pale hyaline and reflecting the pale brown disk of the abdomen above; head finely punctate, most strongly so behind eyes, distinctly longitudinally sulcate on each side of the median lobe; antennæ with the basal joint very strongly incrassate, second joint longer than third, fourth longest; pronotum with a broad central transverse depression, the anterior angles prominently rounded, the lateral margins moderately concavely sinuate, the posterior angles broadly rounded, a little prominent, centrally very finely transversely striate, obscurely punctate, most distinctly so on lateral areas and at anterior and posterior angles; scutellum very finely and thickly granulate, about as broad as long, its margins very obscurely piceous-brown.

Hab. Ceylon; Pundaluoya (Green).

Differing from the Burmese *A. indicus*, Bergr., the only other known species in the fauna of British India, by the absence of the central carination to the scutellum, the more

rounded and less prominent posterior pronotal angles, the more strongly incrassated basal joint of the antennæ, the stramineous corium, &c.

CURRENT NOTES.

By G. W. KIRKALDY.

(Continued from p. 132.)

1. C. P. LOUNSBURY: "Report of Govt. Entom. for 1903" (Cape of Good Hope Dep. Agr. pp. 1-46; pls. i-vii (1904)).
2. DITTO: "Transmission of African Coast Fever" (Agr. Journ. Cape of Good Hope [sep. pp. 1-7] 3 plates (1 coloured) (Apl. 1904) [Arachnida]).
3. C. J. S. BETHUNE [Ed.]: "Thirty-fourth Ann. Rep. Ent. Soc. Ontario, for 1903" (Ontario Dep. Agr. pp. 1-116; portrait, pls. i-iii and text-figs. 1-60 (1904)).
4. A. L. HERRERA [Ed.]: "Las Plagas de la Agricultura" (Com. Paras. agric. Mexico; pp. 1-705, pls. i-xvi, and many text-figs (1904)).
5. A. ZIMMERMANN: "Untersuchungen über tropische Pflanzenkrankheiten" i. (Ber. Land- Forstwirtschaft Deutsch- ostafrika ii. pp. 11-36, pls. i-iv (1904)).
6. E. P. FELT & L. H. JOUTEL: "Monograph of the genus *Saperda*" (Bull. N. York State Mus. 74, pp. 1-86; pls. 1-7 coloured and 8-14 plain; text-figs. 1-7 [Col.]).
7. L. DE LA BARREDA: "El picudo del Algodón" (Circ. Com. paras. agric. Mexico, 6, pp. 1-35 (Apl. 7 1904) [Col.]).
8. C. DAWYDOFF: "Note sur les organes phagocytaires de quelques Gryllons tropicaux" (Zool. Anzeiger xxvii. pp. 589-93, text-figs 1-3 (June 3, 1904) [Dermapt.]).
9. C. P. LOUNSBURY: "A new Oak-tree Pest" (Agric. Journ. Cape Good Hope [sep. pp. 1-4] 1 plate (Dec., 1903) [Hem.]).
10. A. W. MORRILL: "Notes on the immature stages of some Tingitids of the genus *Corythuca*" (Psyche, x. pp. 127-34, pl. 3 (1903) [Hem.]).
11. S. MOKRZECKI: *Thryptocera* (*Gymnopareia*) *pomonellæ* Schnabl & Mokrz., sp. nov., male and female (Diptera, Muscidæ) [sep. pp. 1-4] (1903) [Lep. & Dipt.]).
12. R. E. SNODGRASS: "The Hypopygium of the Tipulidæ" (Trans. American Ent. Soc. xxx. pp. 179-236, pls. viii-xviii (Aug., 1904) [Diptera]).
13. T. W. KIRK: "Report of . . . Biologist" (Ann. Rep. New Zealand Dep. of Agriculture, xii. pp. 247-309 [Diptera] (1904)).

14. M. E. FOUNTAINE: "The Butterfly hunter in search of a long-lost local rarity" (Pall Mall Mag. xxxiii. pp. 253-8; 2 text-figs. (June, 1904)).
15. E. ZANDER: "Zum Genitalapparat der Lepidopteren" (Zool. Anzeiger xxviii. pp. 182-6, text-figs (Oct. 21, 1904)).
16. O. SCHULTZ: "Uebersicht ueber die bisher bekannt gewordenen Fälle von Gynandromorphismus bei paläarktischen Macrolepidopteren nach Familien, Gattungen und Species" (Allg. Zeitschr. für Entom. ix. pp. 304-10 (Aug. 15, 1904)).
17. C. SCHRÖDER: "Kritische Beiträge zur Mutations, Selektions- und zur Theorie der Zeichnungs-phylogenie bei den Lepidopteren iii" (*op. cit.* pp. 281-97; text-figs. 19-28 (Aug. 15, 1904)).
18. L. C. H. YOUNG: "The distribution of Butterflies in India" (Journ. Bombay Nat. History, xv. pp. 594-601 (June 27, 1904)).
19. R. S. HOLE: "Two notorious Insect Pests" (*op. cit.* pp. 679-97, pls. A to E (June 27, 1904) [Lepidoptera]).
20. K. MALKOFF: "Die Cicade Tettigonia viridis L. als Schädiger der Obstbäume in Bulgarien" (Zeitschr. für Pflanzenkrankheiten, xiv. pp. 40-3; 1 text-fig. (March 7, 1904) [Hemiptera]).
21. A. L. EMBLETON: "*Cerataphis lataniae*, a peculiar Aphid" (Journ. Linnean Soc., Zool. xxix. pp. 90-107, pl. 12 (Oct. 31, 1903) [Hemiptera]).
22. E. RÖHLER: "Die Antennalen Sinnesorgane von Tryxalis" (Zool. Anzeiger, xxviii. pp. 188-92; text-figs. 1-4 (Oct. 21, 1904) [Dermaptera]).
23. G. ENDERLEIN: "Die Copeognathen des Indo-Australischen Faunengebietes" (Ann. Mus. Nat. Hungar. I. pp. 179-344, pls. iii-xiv (7 of these coloured) and text-figs. 1-12 (1903) [Neuroptera]).
24. DITTO: "Zur Kenntniss Amerikanischer Psociden (Zool. Jahrb. Abth. für Syst." xviii. pp. 351-64, pls. 17 (coloured) and 18 (1903) [Neuroptera]).
25. DITTO: "Zur Kenntniss Europäischer Psociden" (*op. cit.* pp. 365-82, pl. 19 (col.) and text-figs. A-J (1903) [Neuroptera]).
26. N. YA. KUSNENOV: "O rasviti glastshatikh pyaten gusenits *Dilephila nerii*, Linn., i. *Pergesa porcellus*, Linn." (Russkoe entom. obozr. iv. pp. 154-62; text-figs. 1-6 (Aug. 1904) [Lepidoptera]).
27. D. POMERANTSEV: "Biologicheskaya samyitki o zhukakh polesnikh b' lyisovolstv, zhivoshtchikh pod koroj derev VII." (*op. cit.* pp. 85-9 (May, 1904) [Coleoptera]).
28. S. ALFERAKI: "Byigliya kriticheskaya samyitki k' katalogu tchemuekrilikh gg. Staudinger'a i Rebel'ya 1901, g." (*op. cit.* pp. 1-10 (Feb., 1904) [Lepidoptera]).

29. A. A. YAKHONTOV: "O *Pieris napi* L. var. *intermedia* Krul." (*op. cit.* pp. 15-8 [Lepidoptera]).

The title of the finely illustrated paper of Felt and Joutel (6) is slightly misleading, as it is really a monograph of the American species only, some of which, however, are also European. The descriptions, synonymy and bibliography, habits, &c., are very fully worked out, and the numerous plates are well executed. Barreda (7) discusses the cotton boll-weevil (*Anthonomus grandis*) in a practical manner. He mentions that one estate in Coahuila lost one thousand seven hundred dollars in four years, while another in San Luis Potosi lost one hundred thousand dollars last year. Morrill (10) has given us valuable information on a subject very little studied, the metamorphoses of heteropterous Hemiptera.

It is well known that in certain forms there exist, as well as free leucocytes, very curious special structures named by Dawydoff (8) "phagocytary organs" (lymphatic glands). Apparently these glands are not circumscribed and defined in the cockroaches and mantids (at least in some of them), the same being the case in the nymphs of *Gryllodea*. In certain adults of the latter suborder these organs are well defined and limited; in others, however, this is not the case (*Gymnogryllus*).

Lounsbury's latest publications deal principally with ticks, the Annual Report (1) treating specially of malignant jaundice in dogs. The transmission of African Coast fever (2) is attributed to the tick *Rhipicephalus appendiculatus*, which is considered "the principal, and, perhaps, the only natural transmitter of a highly fatal cattle disease."

Phylloxera corticalis is noted as a new oak-tree pest in South Africa, where it has been causing considerable damage (9). Owing to the fact that the South African oak (*Quercus pedunculata*) has been propagated in that country only from seed, it has remained singularly free from pests, only one other insect, and that also an aphid (*Callipterus quercus*), being confined to it.

Zimmermann's paper (5) deals mostly with fungous diseases, but also with noxious insects, viz.: *Sphinx nerii* on *Cinchona* (pl. iv. figs. 6-8), *Disphinctus* on *Piper capense* (figs. 3-5), *Helopeltis* sp. on *Bixa orellana* (figs. 9-12), and *Thrips* spp. on coffee.

The Commission of Agricultural Parasitology in Mexico has issued a substantial volume (4) of over seven hundred pages on the pests to Agriculture in that country. These are assembled under plant headings, the latter being arranged alphabetically. Sixteen crowded plates and a number of text-figures illustrate the written matter. The introduction is dated Nov. 1901, the cover 1903, but the title-page 1904! Mokrzecki (11) describes

in Latin and Russian a new dipterous parasite from Taurian Belbek, bred from pupæ of *Carpocapsa pomonella*, L.

Snodgrass (12) restricts the term "hypopygium" to the ninth abdominal segment only—that is, the segment that carries the intromittent and clasping organs of the male. The general shape in the Tipulidæ is that of a cup opening posteriorly, the cavity being the genital chamber, which is produced simply by the invagination of the posterior face of the segment, which carries into the depression the tenth segment, which morphologically terminates the abdomen. After a general description of the parts, seventeen genera are discussed at length and illustrated by one hundred and sixty-one figures.

T. W. Kirk's report (13) is specially mentioned here, since it contains (pp. 306-9) descriptions of three new Diptera by T. Brown, viz.: *Tephrites xanthodes*, introduced from Rarotoga and Viti; *Lonchæa splendida*, introduced from New South Wales; and *Drosophila ampelophila*, from Australia.

Miss Fountaine (14) describes a brief tour in Crete, and the chase of *Lycæna psylorita*. Zander (15) discusses the genital apparatus of *Gastropacha quercifolia*. Schultz (16) catalogues the known cases of gynandromorphism in palæarctic Macro-Lepidoptera; while Schröder (17) continues his papers on pattern-phylogeny in the same order. Young (18) considers the distribution of Indian butterflies.

Hole (19) discusses very fully two dangerous enemies of the teak-tree, viz., the moths *Pyrausta macheralis* and *Hyblæa pueræ*. There are five excellent plates, of which one is coloured.

Malkoff (20) describes the damage done to fruit-trees by *Tetigonia viridis*; while Miss Embleton (21) discusses at length the remarkable Aleyrodid-like aphid, *Cerataphis lataniæ*. This has also recently occurred on *Latania* near Honolulu.

Röhler (22) describes and figures some sensory organs on the antennæ of *Acrida* (*Tryxalis*).

Enderlein (23-25) has published three interesting articles on Psocidæ, illustrated by excellent plates. No. 23 is prefaced by a general introduction to the family. Kusnezov (26) discusses in Russian the development of ocellated spots in the larvæ of the sphingids *Deilephila nerii*, Linn., and *Pergesa porcellus*, Linn. Pomerantsev (27) furnishes biological notes, also in Russian, on Cantharidæ and Tenebrionidæ living under bark, and useful in silviculture. Two further papers in Russian (28 and 29) may be commended to the Lepidopterist: Alferaki's contains critical observations on Staudinger and Rebel's 1901 Catalogue, while Yakhontov discusses at some length the variety *intermedia* of *Pieris napi*.

A LIST OF THE "MACRO-LEPIDOPTERA" OF LANCASTER AND DISTRICT.

By C. H. FORSYTHE.

(Concluded from p. 160.)

C. immanata.—Common and generally distributed in July.

C. suffumata.—Fairly common in the County Asylum grounds, Blea Tarn, Quernmore, &c., in April and May. This species comes to light.

C. silaceata.—Fairly common at Arnside and Witherslack in May.

C. fulvata.—Common everywhere about hedgerows in July and August.

C. dotata (pyraliata).—Not common; Halton, County Asylum grounds, Blea Tarn, &c., in July.

Lygris (Cidaria) prunata.—Not common; Arnside, near Quernmore and County Asylum grounds in June.

L. (C.) testata.—Abundant on the moors at Clougha and Quernmore in August.

L. (C.) populata.—Local; it is abundant near Clougha in July and August.

L. (C.) associata (dotata).—Fairly common and generally distributed in June. This species comes freely to light.

Pelurga comitata.—Plentiful in some years in the County Asylum grounds, Grimshaw Lane and Blea Tarn, July and August.

Eubolia cervinata.—This species comes to light, but is not common; Halton and County Asylum grounds in late August and September.

E. limitata (mensuraria).—Generally distributed; abundant in Grimshaw Lane, near Halton, in August.

E. plumbaria (palumbaria).—Common at Heysham, Torrisholme, Blea Tarn, &c., in June.

Carsia paludata (imbutata).—Locally plentiful at Heysham and Witherslack on the mosses in July.

Sterrhia sacraria.—Extremely rare, "I took a specimen at Witherslack some years ago. It went into Mr. J. B. Hodgkinson's collection" (G. L.)

Anaitis plagiata.—Common at Arnside, Witherslack, &c., in July.

Tanagra atrata (charophyllata).—Common near Carnforth and Witherslack about chervil (*Charophyllum temulum*) at the end of June.

Hyria muricata (auroraria).—Local but abundant at Witherslack; less common at Heysham in July.

Asthenia luteata.—Uncommon; near Clougha and at Witherslack in June.

A. candidata.—Fairly plentiful and generally distributed in June.

Acidalia dimidiata (scutulata).—Common in Grimshaw Lane, Quernmore, Halton, &c., in June.

A. bisetata.—Plentiful in Grimshaw Lane, Halton, Heysham, Clougha, &c., June and July.

A. subsericeata.—Uncommon; odd examples at Witherslack in June.

A. immutata.—Uncommon; occasionally at Witherslack and Methop in June.

A. remutaria.—I have only taken this species near Clougha and at Heysham, and bred it from Methop larvæ. The imago appears in May.

A. fumata.—Common; at Heysham, Clougha, and Witherslack in July.

A. aversata.—Common everywhere in July and August; also var. *spoliata*.

Pseudoterpna pruinata (cytisaria).—Fairly common in Grimshaw Lane, County Asylum grounds, Halton, Quernmore, &c., in July.

Geometra papilionaria.—Not common; I have only taken examples at light near the County Asylum in July.

Nemoria viridata.—Local, but common at Methop and Witherslack in June.

Thalera (Iodis) lactearia.—Common in Grimshaw Lane, Ridge Lane, Halton, Arnside, &c., in July.

Hemithea strigata (thymiaria).—Fairly common in Freeman's Wood, and at Heysham, in June and July.

THE LEPIDOPTERA OF BERLIN.

By E. M. DADD, F.E.S.

ONE constantly reads in the magazines of the experiences and captures made by entomologists in Switzerland, the South of France, Italy, Spain, the Balkan Peninsula, Asia Minor, and other distant places, which are mostly quite beyond the reach of the ordinary entomologist with probably only a short holiday at his disposal.

Having read with avidity the brilliant successes achieved by his more fortunate brethren in the Eldorados above mentioned, it may occur to him that perhaps if he did not go quite so far afield he might yet enjoy a good deal of sport, and at the same time not waste a large portion of his holiday in travelling.

It has always been somewhat of a surprise to me that none of the gentlemen who make annual trips to the Continent have thought Germany worthy of their attention. Although its butterfly fauna is certainly not so rich as that of Switzerland, still it is very rich, and on any sunny day during the summer insects swarm in such countless numbers that one is at a loss what to catch next.

It has been my good fortune to be removed from London to Berlin, a district which is remarkably rich in Lepidoptera, as will be seen from the fact that the latest list of the Macro-Lepidoptera (Bartel and Herz) records eight hundred and thirty-two species as occurring in the district, to which have since been added several more; and in the present paper I should like to give entomologists an idea of what can be had here all the year

round. As I have collected here fairly regularly from June 1st, 1902, till the end of the 1904 season, I think I may fairly claim to have a good idea of what can be done in this district.

What is understood as the Berlin district is the tract of country contained within about a twenty-mile radius of the centre of the city. This includes a very varied country both as to soil and vegetation, which accounts for the richness of the fauna. The greater portion is of course the usual sandy soil of the Great Plain of Prussia, but by Rüdersdorf in the east there is an outbreak of chalky limestone, forming downs fairly similar to our Kentish or Surrey ones, and it is here, of course, that such species as *Lycæna corydon*, *L. minima*, the three rare *Zygænæ*, &c., appear. The whole district is fairly well wooded, the greater portion being pine or fir woods, but there are also magnificent oak and beech woods, and in the swampy portions, which are fairly frequent, alder and birch predominate. Here and there over the whole district, and especially by Bernau in the north, there are extensive heaths, and these are sometimes covered with juniper bushes. In the larger pine woods there is frequently a thick undergrowth of bilberry; in the deciduous woods, of raspberry and buckthorn. Whitethorn, blackthorn, and the wild briar are conspicuous by their absence; only on the downs at Rüdersdorf do they appear to grow wild. Bramble and sallow much rarer than in England; willow is also extremely rare. Aspen, lime, and black poplar are all common all over the district. The commonest tree after pines and firs is undoubtedly the birch. Notable absentees amongst low plants are the primrose, foxglove, bracken, and gorse. By far the commonest plant on open uncultivated land is *Artemisia vulgaris*, the food-plant of *Cucullia argentea* and *C. artemisiæ*, *Eupithecia innotata*, &c.

Fenland and water-side vegetation is frequent, seeing that two rivers, the Spree and the Havel, and about ten large lakes are in the district.

During the winter months very little collecting could be done, but searching the trunks of oaks and alders produced cocoons of *Hoplitis milhauseri* and *Cerura bicuspis*, and, when the lakes are frozen over, and one can get at the reeds, the larvæ of *Senta maritima* and *Leucania obsoleta* may be secured in numbers. The former is obtained by searching the old burrows of *Nonagria geminipuncta*, in which they conceal themselves; the larvæ are easily reared on shredded steak, apple, and other unlikely substances, but must be provided with reeds to hide in, as they otherwise die. *L. obsoleta* is far easier detected; the reeds inhabited by the larvæ, probably owing to its having eaten through the skin to form its exit, are generally bent over, probably by wind, and all one has to do is to cut the reed low down. This larva hibernates full-fed, and is easily reared; it

of their abundance. At the edge of the wood *Acidalia immutata*, *A. immorata*, and *Strenia clathrata* had been netted; in the wood itself we were kept constantly busy with *Ephyra punctaria*, *Timandra amata*, *Larentia ocellata*, *L. variata*, *L. fluctuata*, *L. montanata*, *L. ferrugata*, *L. sociata*, *L. unangulata*, *L. albicillata*, *L. tristata*, *E. oblitterata*, *A. luteata*, *Hypsipetes trifasciata*, *Cidaria corylata*, *Tephroclystia satyrata*, *Collix sparsata*, *Abraxas marginata*, *Deilinia pusaria* and *D. exanthemata*, *Semiothisia notata* and *S. alternata*, *Boarmia luridata*, *T. punctulata*, and *Pechipogon barbalis*; while one male specimen of *Macrothylacia rubi* was found drying its wings, and another was netted, and a pair of *Phalera bucephala* were found in cop.

On the way home a few additions were made, notably one specimen of *Triphosa dubitata*, *M. murinata*, *Panagra petraria*; and also, flying in the dusk, one each of *Drepana falcataria* and *D. binaria* were netted.

Monday, June 1st, being the Whitsun Monday, I had arranged with several friends to visit the beech woods of Brenau, our principal quarry being *Tephrosia consonaria*. Although sunshine was scarce, it was a very close hot day, and not at all agreeable for collecting. To reach the beech woods in question we first had to traverse a fairly long stretch of tall pine woods, which had a thick undergrowth of bilberry. Here and there were also open patches of heather. Butterflies were not much in evidence, the principal ones noted being *Callophrys rubi* (very worn), and *Chrysophanus dorilis* and *C. phlæas*.

Geometræ by no means swarmed as they had done on the day previous, and, with the exception of *T. putata* and *A. remutata*, very little was seen at first; however, in the first patch of bilberry a fine *Larentia hastata* was netted, and almost immediately afterwards something started up out of the bilberry, which was not recognized. After a long stern chase this was netted, and proved to be apparently *Ortholitha plumbaria*, a very large bluish-grey form, and quite different to our English ones. As the time of appearance—beginning of June—and getting worn are so entirely different to the habits of what we know as this species in England, where I have always found it at the end of July and during August, and besides which the insect seems quite different to our English *plumbaria*, being larger, more bluish in colour, and not so variegated, I consider that this may possibly be a distinct species. My friend Herr Herz, to whom I mentioned my doubts, is also of opinion that there is something queer here, as he had captured our English form at the end of July on the sea-coast. I would be much obliged if some English entomologist would obtain eggs of *O. plumbaria* during the coming season, and I will try and elucidate the matter.

Several specimens of this interesting form were obtained; meanwhile *L. hastata*, *Epione advenaria*, and *Eucosmia undulata*

were fairly common, the latter being by no means easy to capture, as, although a conspicuous insect, its colour harmonizes well against a background of bilberry and pine-trunks, and it is more often lost sight of than captured. Another conspicuous species easily lost sight of is *L. hastata*; its habit is to fly about twelve feet from the ground, and it has a very undulating flight; consequently, when flying amongst trees with the light shining through them, it easily eludes capture. Nothing further of interest was observed until we reached the restaurant where we were to dine, when my brother, who had been for a stroll round the lake, brought me a fine fresh specimen of *Lithostege farinata*, Hufn.

After dinner we made tracks for the beech woods, and while crossing a small meadow I observed *Ino statice* in some numbers on flower-heads. The beech woods unfortunately proved a failure as far as *T. consonaria* was concerned, not a single specimen being found by four diligent searchers; but *Demas coryli*, *Dasychira pudibunda*, *Lithosia aureola*, and *Ephyra trilineata* were found in odd specimens, and an occasional *Tephrosia luridata* raised our hopes in vain. *Larentia variata* was found in a small pine wood, but nothing further of note. On the way home *E. undulata* was more easily captured, as it adopted the habit of flying lazily along the road. Amongst the bilberry, *T. putata* was, as usual, freshly emerging, and I started up, but lost a fine specimen of *Bomolocha fontis*.

On June 6th, 8th, and 11th I sugared, with my friend Zobel, in the neighbourhood of Bernau; the locality chosen, at first sight, did not look at all promising, the sugared trees being on the border of an extensive pine wood; adjoining was a barren waste of land, overgrown with rank grass and, what appealed especially to us, patches of heather; the insect we had hope of getting being *Agrotis molothina*, an ally of *A. strigula*, and up to then only known in four or five specimens by Berlin. We had already sugared this spot about five times without any result worth speaking about. However, patience was at length rewarded, as on the three nights in question not only did we get our *A. molothina* in thirty to forty specimens, but also discovered four other insects, which are reckoned amongst Berlin's rarities; they were *Mamestra aliena*, *Hadena adusta* var. *baltica* (probably a good species, as it is quite different to English *adusta*), *Caradrina selini* var. *milleri*, and *Agrotis candalarum*. All these species were abundant; in one evening alone my take was forty-four *C. var. milleri*, twelve *M. aliena*, and fifteen var. *baltica*. But this by no means ends the list; other lesser stars were also in abundance:—*Acronycta abscondita*, *A. rumicis*, *Agrotis strigula*, *A. linogrisea*, *A. orbona* (subseque), *A. cinerea*, *A. exclamationis*, *A. ypsilon*, *A. segetum*, *A. prasina*, *A. occulta*, *Mamestra leucophæa*, *M. advena*, *M. nebulosa*, *M. brassicæ*, *M. albicolon*, *M.*

oleracea, *M. dissimilis*, *M. thalassina*, *M. contigua*, *M. pisi*, *M. trifolii*, *M. dentina* and var. *latenai*, *Neuria reticulata*, *Miana strigilis*, *Hadena sordida*, *H. rurea* and var. *alopecurus*, *H. basilinea*, *H. gemina* and var. *remissa*, *Dipterygia scabriuscula*, *Trachea atriplicis*, *Leucania pallens*, *L. comma*, *L. conigera*, *Grammesia trigrammica*, *Rusina tenebrosa*, and *Cymatophora* or.

During the latter part of June and the first fortnight in July the butterfly season is at its height, and we made many excursions to the localities above mentioned. The 13th was a lovely sunny day, which we again spent at Finkenkrug. One of the first butterflies captured was a fine specimen of *Papilio machaon*; a specimen of *Mamestra glauca* was found at rest on a tree-trunk, and almost immediately afterwards we were in the thick of the Meliteas—at present only *M. aurinia* and *M. cinzia*; while *Lycæna amanda*, *L. icarus*, *Chrysophanus hippothoe*, and *C. alciphron* are abundant. The tree-trunks are now frequently tenanted by Psychid cases—*Sterrhopteryx hirsutella*, *Acanthopsyche opacella*, *Canephora unicolor*, *Bacotia sepium*, *Epichnopteryx pulla*, and *E. nitidella*. A peculiarity about *C. unicolor* is that only the males select tree-trunks to spin up on; the female cases are always found spun up amongst herbage. Geometræ seem to have tailed off, the only Larentias observed being *tristata*, *ocellata*, and *sociata*. In the meadows, however, *Acidalia immorata* was fairly common, with occasional *A. ornata* and *A. immutata*, *S. clathrata* and *M. murinata*. On tree-trunks, *Acronycta psi*, *A. leporina*, *A. abscondita*, *Moma orion*, *Sphinx pinastri*, and *E. armia consortaria* were frequent: one specimen of *Drymonia naonia* and two of *Lophopteryx camelina* beaten out of oak, and *D. lacertinaria* netted. Larva-beating was almost too trying owing to the heat, and very little worth mentioning obtained. Oak produced *Catocala sponsa* (full-fed), and *Zephyrus quercus*, while Herr Wadzeck was fortunate enough to beat a larva of *Arctornis (Laria) l-nigrum* from lime. In the afternoon a case of *Psyche viciella* was found among herbage, several worn specimens of *Hemaris bombylifformis* netted, while a grove of old aspens produced the larvæ of *Trochilium melanocephalum* in plenty. The method of obtaining these latter is fairly simple; the lower twigs and branches die off in the same manner as do those of firs, and all one has to do is to break off these twigs, and examine the fracture for the fresh galleries of *T. melanocephalum*. In this manner we obtained about a dozen larvæ in a very short time. The smaller aspens were beat for larvæ of *Apatura ilia* and *Limenitis populi*, and a few of each were obtained.

Sugaring one night at Wusterhausen was very successful,¹¹ and the following were obtained in numbers:—*Acronycta psi*, *A. menyanthidis*, *A. auricoma*, *A. abscondita*, *A. rumicis*, *Agrotis obscura*, *A. simulans*, *A. cinerea*, *A. exclamationis*, *A. segetum*, *A. primula*, *Mamestra leucophæa*, *M. nebulosa*, *M. brassicæ*, *M. albi-*

colon, *M. oleracea*, *M. genistæ*, *M. dissimilis*, *M. thalassina*, *M. dentina*, *Neuria reticulata*, *Hadena sordida*, *H. basilinea*, *H. gemina*, *D. scabriuscula*, *Hyppa rectilinea*, *Trachea atriplicis*, *Euplexia lucipara*, *Leucania pallens*, *L. albipuncta*, *G. trigrammica*, *Rusina tenebrosa*, *Teniocampa incerta* (very worn), *Erastria fasciana*, *Plusia gamma*, *Pseudophia lunaris*, and *Metopsilus porcellus*. The sugaring was so good that we kept at it all night, and were rewarded by a good series of *P. lunaris* each, though they were getting over.

As soon as it was daylight we commenced bumping trees for "prominents," and the following were brought down:—*Hoplitis milhauseri* (worn), *Drymonia chaonia*, *Notodonta dromedarius*, *N. trepida*, *Spatalia argentina*, *Lophopteryx camolina*, *Hylophila prasinana*, *H. bicolorana*, *Dasychira pudibunda*, *Boarmia consortaria*, *B. extersaria*, &c.

Towards the end of June the butterfly season commenced in earnest, and a long day spent in the woods near Spandau produced the following in abundance:—*Pieris brassicæ*, *P. napi*, *P. rapæ*, *Leucophasia sinapis*, *Gonepteryx rhamni* (worn), *Apatura iris*, *A. ilia* and var. *clyte*, *L. populi* (the four latter attracted by Limburger cheese), *Araschnia levana*, *Melitæa aurinia* (worn), *M. cinxia*, *M. didyma*, *M. athalia*, *M. aurelia*, *M. dictynna*, *Argynnis selene*, *A. ino*, *A. lathonia*, *A. dia*, *A. aglaia*, *A. niobe*, *Pararge egeria*, *Cænonympha iphis*, *C. arcania*, *C. pamphilus*, *C. tiphon*, *Chrysophanus hippothoë*, *C. alciphron*, *C. doris*, *C. phlæas*, *Lycæna astrarche*, *L. eumedon*, *L. icarus*, *L. amandus*, *L. semiargus*, *L. alcon*, *Heteropterus morpheus*, *Adopæa lineola*, *A. thau-mas*, *Augiades comma*, *A. sylvanus*, *Hesperia alveus*, *H. malvæ*. The burnets were also commencing to get about, though only *Zygæna meliloti* and *Z. trifolii*; *Lithosia muscerda* and *L. griseola* were common. *Acidalia emarginata* and *A. aversata* were perfect scourges, single examples each of *Ephyra pendularia*, *Hemithea strigata*, and *Geometra papilionaria* were netted. While beating a small birch tree I had the good fortune to beat out a freshly emerged *Sesia scoliaeformis*.

In the marshy spots favoured by *C. tiphon* and *M. dictynna*, *Bankia argentula*, *Hydrelia uncula*, and *Erastria venustula* were not infrequent, as also a large "fanfoot," which turned out to be *Herminia tentacularia*. Tree-trunk searching results in a few odds and ends, *Moma orion*, *Boarmia consortaria*, *B. roboraria* and var. *infusata*, and *Larentia trifasciata* being turned up; but *Geometræ*, for some unknown reason, appeared to be very rare at this season, only *L. sociata* being at all common. On the homeward journey two *L. quadrifasciaria* were found at rest.

Another outing at the beginning of July found most of the above-mentioned butterflies getting over, but *C. dispar* var. *rutilus* was in fine condition; one specimen of *L. sibylla* was netted, and *Dryas paphia* was fairly frequent.

During the latter half of June and the beginning of July we sugared pretty regularly in oak and alder woods by Spandau; most of the insects above mentioned continued to come, but the weather was unfavourable, and we did not have more than two or three favourable nights. The new arrivals were as follows:—*Acronycta tridens*, *A. leporina*, *Agrotis signum*, *A. ianthina*, *A. linogrisea*, *A. fimbria*, *A. augur*, *A. pronuba*, *A. brunnea*, *A. triangulum*, *A. prasina*, *A. occulta*, *Mamestra advena*, *M. tincta*, *M. nebulosa*, *M. persicariae*, *M. splendens*, *M. contigua*, *Dianthæcia cucubali*, *Hadena monoglypha*, *H. lateritia*, *H. lithoxylea*, *H. sublustris*, *H. scolopacina*, *H. unanimis* and *H. pabulatricula*, *Cloantha polyodon*, *Nenia typica*, *Leucania impudens*, *L. impura*, *L. straminea*, *L. l-album*, *L. lithargyrea*, *L. turca*, *Toxocampa pastinum*, *Lithosia complana*, *L. muscerda*, *Cymatophora or*, and *Asphalia duplaris*. A somewhat unexpected visitor was a large female *Cossus ligniperda* (*cossus*); is this species frequently attracted to sugar?

About the middle of July we deserted our sugaring ground at Spandau, and selected a new one at Buch. The ground in question was the border of an extensive pine wood which ran for about half a mile along a rye field. About the middle of this field was a small pond overgrown with rushes, reeds, and marsh-grass, and the extreme border of the field was bounded by a small stream overgrown with alder, oak, and other deciduous trees. Beyond one end of the wood was an extensive clearing which had been recently deforested, and was now covered with rank growth. At the further end the ground was again crossed by another brook, about which were several reed-grown meadows. We sugared this spot fairly regularly from the middle of July to the end of August, and, taken all round, the results were very good. Quite a different lot of insects were obtained here. *H. lateritia* and *H. furva* were in countless numbers; *H. monoglypha* and *H. lithoxylea* were also abundant, but *H. sublustris*, which had been so common at Spandau, was never seen. Other absentees were *A. prasina*, *L. turca*, *L. pudorina*, and *L. impura*. A fine variety of *C. or* was taken here, the figure of 80 being bright yellow.

Among others, we captured during this period *Acronycta leporina*, *A. megacephala*, *A. auricoma*, *A. abscondita*, *A. rumicis* (all second brood), *Agrotis obscura*, *A. orbona*, *A. baia*, *A. c-nigrum*, *A. xanthographa*, *A. plecta*, *A. tritici*, *A. obelisca*, *A. segetum*, *A. occulta*, *Mamestra advena*, *M. oleracea*, *M. aliena* (one female, second brood), *M. dissimilis*, *M. trifolii*, *M. dentina*, *Miana ophiogramma*, *M. strigilis*, *M. bicoloria*, *Bryophila algæ*, *H. furva*, *H. monoglypha*, *H. lateritia*, *H. lithoxylea*, *H. gemina*, *H. secalis*, *T. atriplicis*, *B. meticulosa*, *H. leucostigma*, *H. nictitans*, *Tapinostola hellmanni*, *T. fulva*, *L. pallens*, *L. comma*, *L. conigera*, *L. albiguncta*, *L. lithargyrea*, *Caradrina quadripunctata*, *C.*

milleri, *C. morpheus*, *C. alsines*, *C. taraxaci*, *C. ambigua*, *Amphipyra tragopogonis*, *A. pyramidea*, *Calymnia trapezina*, *Cosmia paleacea*, *Dyschorista suspecta*, *D. fissipuncta*, *Pyrrhia umbra*, *Catocala nupta*, *Aventia flexula*, *Zanclognatha tarsipennalis*, and *Z. emortualis*. A fine specimen of *Cerura furcula* was found at rest on a pine-trunk. *Neuronia cespitis*, *N. popularis*, *Plusia chrysitis*, *P. festucae*, and *G. papilionaria* came to light. *Rhodostrophia vibicaria*, *Scotosia vetulata*, *Cidaria prunata*, *C. populata*, *C. associata*, *C. dotata*, *C. truncata*, *Larentia fumata*, *L. didymata*, *L. vittata*, *L. bilineata* and *L. comitata*, *Phibalapteryx polygrammata*, *Ellopiopsis prosapiaria*, *Semiothisa liturata*, *Boarmia roboraria*, *B. lichenaria*, *Gnophos obscuraria*, *Bupalus piniarius*, *Perconia strigillaria*, *Acidalia bisetata*, *A. deversaria*, *A. emarginata*, and *A. marginepunctata* were netted while putting on the sugar.

On July 27th a visit was paid, with a couple of friends, to the limestone hills of Rüdersdorf. The day was delightful, and butterflies were in profusion. *Dryas paphia*, *Argynnis aglaia*, and *A. niobe* were in fine condition; *Epinephele jurtina*, *C. arcania*, *C. iphis*, and *C. pamphilus* were in countless numbers. *Chrysophanus virgaureæ* was in fine condition. The blues were somewhat scarce, only two *Lycæna cyllarus*, two *L. arion*, and about a dozen *L. argus* being boxed. Up a stony path a fine *A. lathonia* was netted as it was sunning itself on a stone, and then I saw for the first time that fine butterfly, *Satyrus alcyone*, sailing majestically through the air. It is fairly difficult to capture; one must wait till it settles, and then approach carefully. In about half an hour four fine specimens were netted. Its near relative, *S. semele*, was also about. Both these species have the habit of settling on pine-trunks, and are then quite invisible. Later in the season we frequently found *S. alcyone* sitting on the old sugar patches when putting on the sugar, and a good series were thus secured. A few worn *M. athalia* and *M. didyma* were also obtained. All this time a small Hesperid had been dashing about; this we at first left severely alone, believing it to be the common *A. thaumas*, but a chance capture apprised us of the fact that it was *A. actæon*, and a fine series was soon obtained. Butterflies are common enough, but they cannot compete with the burnets, which are now out in full force. *Zygæna meliloti*, *Z. purpuralis*, *Z. loniceræ*, *Z. trifolii*, and *Z. filipendulæ* are all about equally common, the latter being perhaps the commonest; *Z. meliloti* and *Z. trifolii* were getting worn.

Our objective being the limestone hills, we had to leave this Eldorado, and for about an hour our way led through a fairly gloomy pine wood. Much to my astonishment, a species of *Melitæa* was fairly common, together with *C. arcania*, all through these woods. I captured a good many, and they proved very variable, some striking varieties being amongst them; but the question is what are they—*M. athalia* or *M. aurelia*? I confess

I cannot say, and my Berlin friends all differ. We at length came to the edge of the lake, and a few each of *S. alcyone*, *S. semele*, and a freshly emerged *Vanessa polychloros* were netted.

A steamer carries us across the lake, and in ten minutes we are on the limestone hills, which remind one very much of our Kentish or Sussex downs. Here the entire fauna is changed as if by magic. *Lycæna corydon*, *L. minima*, *Melanargia galatea*, *Vanessa urticæ*, and *Epinephele jurtina* seemed to be the only butterflies about; an occasional worn *L. icarus* was observed. To make us appear more at home, *Ortholitha (Eubolia) bipunctaria*, *O. (E.) limitata*, and *L. (M.) galiata* are frequent. Burnets are still common, and as three special species occur here, and constitute our quarry, these are all netted for examination. *Z. purpuralis* seems to be the favourite here, and many are netted and let go, until finally we are rewarded by the first *Z. achillæ*. It seems to be too early for this species, and there are no signs of *Z. carniolica* and *Z. ephialtes* var. *berolinensis*; so we decide to shift our quarters. A fairly thick spinney attracts our attention next, and we beat patiently through it in the hope of *Geometræ*, but nothing but *Larentia bilineata* rewards our efforts. Sweeping the herbage at this point produces *Sesia ichneumoniformis* in some numbers; also a male of *Malacosoma castrensis*. *Prothymnia viridaria* is fairly common; one *Emmelia trabealis* and one *Acontia luctuosa* are netted, and one *Endrosa irrorella* and *Cybosia mesomella* found at rest on herbage.

While my two companions are still engaged with *S. ichneumoniformis*, I discovered a deep dell in the hillside which had escaped the scythe. A large "skipper" is flying about, which proves to be *Hesperia carthami*, and another is captured a few minutes later; and, the other two coming up, a systematic search is made for it without further result. Shortly after this the first *Z. carniolica* is secured, and other specimens are obtained sparingly. *Z.* var. *berolinensis* is also found in a few odd specimens, but it is evidently too early for these two species. It now being nearly five o'clock, all our boxes being full to overflowing, and we very tired and hungry, we decide to give up collecting for the day, which for the writer of these notes, at least, had been a very prolific one.

As my bag of *Lycæna arion* had been confined to one specimen, and as I was very desirous of getting a long series of this beautiful "blue," I decided to devote the following Sunday (August 3rd) to a visit to Bernau, where I was told the insect abounded. This is rather an awkward locality to reach, as after leaving the train one has a good hour's walk through open corn-fields before reaching the woods, and this is no fun when the sun is doing his best. On the roadside few butterflies were in evi-

dence—chiefly *E. jurtina* and *C. phlæas*—the only thing I netted being a worn specimen of *Emmelia* (*Agrophila*) *trabealis*.

Arrived at length at the woods, things soon commenced to improve; *Dryas paphia* was everywhere, though somewhat worn, and the patches of thyme were covered with *E. jurtina*, *C. arcania*, *C. phlæas*, *C. virgaureæ*, and *L. argus*; as yet, however, no signs of *L. arion*.

At length a worn specimen was netted; a fine *Grapta c-album* is next added to the bag, and then my attention was caught by a very small *E. jurtina*, which on being netted turned out, to my delight, to be the local *E. lycaon*. A good series of this insect was soon collected, and of *L. arion* some dozen specimens were captured, all, however, considerably worn. A very worn specimen of *C. rubi* showed the second brood of this insect was getting over, and then, to my utter surprise, I netted a fine female *Zephyrus quercus* on the thyme. I had never seen this species so low before, and, to make matters still more extraordinary, there were no signs of oak for miles, so to speak. A specimen of *Pararge megæra* was netted; this species, as far as my experience goes, seems to occur everywhere in isolated specimens.

Whilst searching the heather a specimen of *Agrotis strigula* was started up and netted; two more were secured in the same manner, as also a specimen of *A. vestigialis*. On a piece of waste ground a few specimens of *Coscinia striata* and *C. cribrum* were netted, and here *Argynnis niobe*, *A. aglaia*, *Satyrus aleyone*, and *S. semele* were abundant. Geometræ were conspicuous by their absence, only an odd *E. atomaria* of the second brood being observed.

During this month the lamps in the Thiergarten proved very attractive, and were regularly besieged by *Euproctis chrysorrhæa*, whose larvæ had defoliated the Thiergarten earlier in the year. The visitors were principally Lymantrids—*E. chrysorrhæa*, *E. auriflua*, *Stilpnotia salicis*, *Lymantria dispar*, and *L. monacha*; but I also saw a specimen of *Rhyparia purpurata*, and obtained a few specimens each of *Enistis quadra*, *Malacosoma neustria*, *Odonestis pruni*, *Dendrolimus pini*. *Luperina testacea*, *Epineuronia popularis*, *Hydræcia micacea*, and *Caradrina morpheus* seemed to be the only Noctuæ attracted, *Boarmia repandata* (worn), and *Ennomos quercinaria* the only Geometræ.

About this time I went for a short holiday to the Glätzer Gebirge, a portion of the Riesengebirge. Everything in the butterfly line seemed worn to rags. *D. paphia*, *Argynnis lathonia*, *A. niobe*, *A. aglaia*, *Melitæa athalia*, *Chrysophanus virgaureæ*, *C. hippothoë*, *Lycæna hylas*, *L. semiargus*, *L. icarus*, *L. amanda*, and *Melanargia galatea* were all practically over, and scarcely a good specimen could be obtained. *Pararge mæra* was, however, just nicely out, and I was very pleased to meet with

Erebia ligea for the first time. This insect was fairly common everywhere on the lower slopes, but unfortunately getting worn, and a good many had to be netted and examined before a nice series of both sexes was obtained. Geometræ were fairly plentiful, however, and especially on the hillsides amongst the bilberry a good many could be beaten out. By diligent working I obtained a fair series of the following:—*Acidalia perochraria*, *A. straminata* and *A. degeneraria*, *A. immutata*, *Ortholitha limitata* and *O. bipunctaria*, *Anaitis præformata*, *Lygris populata*, *L. reticulata* and *L. associata*, *Larentia didymata*, *L. cæsiata*, *L. unidentaria*, *L. verberata*, *L. unifasciata*, *L. adæquata*, *L. minorata*, *Gnophos obscuraria*, *Thamnonoma wavaria*, and *Odezia atrata*.

I did not sugar once, but tried light, with very indifferent results—two *Arctia caia*, one *Amorpha populi*, several *Plusia chrysitis*, *Ce. quadra*, *B. lichenaria*, and some common Noctuæ.

Once we made an excursion to the top of the Schneeberg, 5600 ft., but the day was unfavourable, and very little was about. As one commenced to get higher up *Erebia ligea* was replaced by *E. euryale*, and I obtained a fine series of this species in grand condition. *Pyrameis cardui* was everywhere, but difficult to capture; *Pararge mæra* was also in fine condition, and several pupæ of this species were found attached to boulders.

A sight I will never forget was a single isolated boulder with an overhanging surface about two yards square. Settled on this surface I counted no less than forty-seven specimens of *Larentia cæsiata* in all sorts of conditions. I secured about a dozen whilst the rest were decamping.

Arrived at the top of the Schneeberg, the sun disappeared for good, and only a few isolated specimens of *Erebia euryale* were observed. The flora was quite alpine here—yellow violets, a very hairy *Campanula*, a large hairy hawkweed, and, above all, a fine large pinky-white spike (a species of knotgrass), which was growing everywhere. This latter proved exceedingly attractive to a species of *Agrotis*, which was here flying about in broad daylight, and settling on these flowers. I secured a fair series, but have not yet determined the species, but it is probably *A. collina*.

The last entomological experience was the discovery of an immense colony of *Vanessa antiopa*, which produced in good time seventy-four imagines, all perfectly typical. They were feeding on birch and willow, and, as far as I could see, were perfectly free from ichneumons.

(To be concluded.)

NOTES AND OBSERVATIONS.

THE University of Oxford has already conferred academic honours on more than one entomologist. To the ranks of the Masters of Arts must now be added Commander J. J. Walker, R.N., F.L.S., and one of the Secretaries of the Entomological Society of London, upon whom was conferred the degree "honoris causa," at a Convocation held in the Sheldonian Theatre on Thursday, June 29th. Introduced in a Latin speech which did justice to the recipient's world-wide work in the service of entomology, Commander Walker, as he emerged in his crimson hood and Master's gown, received the congratulations of several members of the Council of the Society who were present for the occasion, including Professor E. Poulton, D.Sc., F.R.S.; Dr. F. A. Dixey, M.D.; Mr. H. Rowland-Brown, M.A.; and Mr. G. C. Champion, F.Z.S. Meanwhile it is pleasant to note the encouragement given to entomologists in Oxford just now; and it is only to be hoped that the sister university will presently develop a similar enthusiasm. The Entomological Society of London, indeed, has found a number of valuable recruits of late years at Oxford, in rather striking contrast to the small number of resident graduates enlisted at Cambridge.—H. R. B.

PHALONIA (ARGYROLEPIA) BADIANA, Hb.—Stainton (1859) says in Manual, "Larva in the stems and roots of burdock." Wilkinson (1859) says, "The larva feeds in the stems and roots of *Arctium lappa*." Meyrick (1895) says, "Larva in stems and roots of *Arctium lappa*." Last autumn I brought home a few seed-heads of burdock which had some *Tortrix* larvæ feeding in them. From these I have just bred this species.—T. A. CHAPMAN; "Betula," Reigate, June 26th.

OVA OF BRITISH BUTTERFLIES WANTED.—Among other ova that I am anxious to obtain figures of are those of *Argynnis aglaia*, *A. adippe*, *Limenitis sibylla*, *Apatura iris*, *Erebia athiops*, *Satyrus semele*, *Epinephle tithonus*, *Cyaniris argiolus*, *Augiades comma*, *Adopæa thaumas*, *A. actæon*, and *Pamphila palæmon*. If any one has an egg or two of either of these to spare, and would kindly send them to me, I should be greatly obliged.—R. SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—Among some useful insects presented by Mr. Eustace Banks is the type of *Noctua subfusca*, Haw., which the donor recognizes as a dark form of *Agrotis corticea*. Mr. Prout has also added some specimens from ancient collections, and of them one is *Phytometra lutescens*, Haw. (*arcuosa*, Haw., var.).

THE ENTOMOLOGICAL CLUB.—A meeting was held at the 'Hand and Spear' Hotel, Weybridge, on July 11th, 1905. Mr. G. T. Porritt, of Huddersfield, was the chairman and host of the evening. Of the seven guests Messrs. Adkin and Donisthorpe were the only other members of the Club present.

MIGRATION OF LEPIDOPTERA.—Living, as I do, on the south-east coast of England, I take an interest in this question and lose no opportunity of watching any fresh species that comes in my way. The wind here is a great drawback to the collector of Lepidoptera, but possibly it is a benefactor as well. For some years past I have watched

the gas-lamps close to my house, one of which is conveniently situated under the trees at my front door, and early this month I was surprised to notice, inside a lamp, three or four specimens of *Euchelia jacobæ*, an insect I have never seen in Margate during the twenty-five summers that I have been resident here; nor have I heard of one being seen by any other collector—novice or otherwise. I examined ten or twelve gas-lamps, and *E. jacobæ* had found its way into several of them, and in all I saw about a dozen specimens. I may say that our gas-lamps are fitted with incandescent burners, so that insects cannot well reach the flame, but I should say suffer from the heat; and the posts are not suitable for "swarming." One specimen only was outside a lamp, and this I captured. Considering that there is not much ragwort on the outskirts of Margate, I am wondering whence these specimens came. The following day we had a drenching rain (two inches in a little over the twenty-four hours), and I have not seen another specimen since. I am inclined to think the trains may bring the parents of visitors of this kind, as the specimens were all seen within a hundred yards of the railway, and most of them within fifty yards—at lamps on each side of the railway. The wind and rain have hindered entomological work very much this June, but on Thursday (the 15th inst.) we had an ideal "lamp" night. One lamp—on the railway-bridge—occasionally attracts *Neuria saponaria* (*reticulata*) early in June; on this evening it produced six examples, and the ironwork was well carpeted with *Acidalia promutata* (*marginipunctata*). First broods were also in evidence at other lamps: for example, *Aspilates citraria* (*ochrearia*), *Agrotis puta*, and *Acontia luctuosa*, besides a goodly number of common species; but I was most interested in the novelties which appeared. The first was a shark, inside the lamp, so I fetched my ladder, and to my satisfaction it proved a good specimen of *Cucullia chamomillæ*, and this was followed by *Hadena genistæ*, also good, both fresh to my local list. But what surprised me most of all, just as I decided to go to bed, was a *Sphinx*, in a very wild state—I almost took it for a bat at first. I had the good fortune to get it in my net, and it proved to be a male *S. convolvuli*. I have taken this insect once before in June, at rest on a post near Worth Mill, Sandwich, but in that year I had no autumnal specimens brought to me. The question arises, Is this specimen a migrant, or has the pupa lain over for the winter in this country? *Vanessa cardui* has been commoner in Margate lately than in ordinary seasons; the specimens are very thinly scaled, which also points to migration.—J. P. BARRETT; St. John's Villas, Margate, June 18th, 1905.

CAPTURES AND FIELD REPORTS.

PHTHEOCHROA (COMMOPHILA) RUGOSANA IN SURREY.—On June 2nd, 1904, when walking over the Kenley downs, a small moth took wing from among the long grass, and settled again a few yards away. It was ultimately secured, and proved to be a fine fresh example of *P. rugosana*. So far as I could ascertain, there was no bryony, the food-plant, in the immediate vicinity. The only previous Surrey record I am aware of is that in the 'Victoria History of the

Counties of England,' vol. i. Insecta, p. 138, where it is stated that this species was once taken by Mr. Sydney Webb near Dorking.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

LIMACODES TESTUDO IN GLOUCESTERSHIRE.—As I find that Mr. Barrett does not mention this county as a locality for this species, it may be of interest to record that a very fine female example was beaten out of an oak-tree on June 5th last near here by the Rev. E. M. Smith.—C. GRANVILLE CLUTTERBUCK; Gloucester.

CYMATOPHORA OCTOGESIMA (OCULARIS) IN EPPING FOREST.—It may be of interest to record the capture of two specimens of *C. octogesima*, one on the evening of June 30th, and the other on the following evening (July 1st). I believe that this species is found, as far as Epping Forest is concerned, only at the south end of the wood, and my two were taken on sugar in the garden at "Normanhurst," Chingford, where I am residing. I might mention that I took the female on June 30th, and, thinking that a male might be in the neighbourhood, I sugared again on the following night, and was successful in taking a very good example of that sex. I believe there are few records of *C. octogesima* having been taken in Epping Forest.—R. T. BAUMANN.

LEUCANIA FAVICOLOR, Barrett.—A fine example of this species flew into my room, attracted by the light, on July 4th, at 10.50 p.m. An example of the red form, ab. *rufa*, Tutt, flew into the same room, and at about the same time, last September. Of the six or seven individuals which I have previously captured at different times here, all have been ab. *rufa*. I am indebted to Mr. Eustace Banks for having last autumn first called my attention to the fact that I had taken *favicolor*, always having supposed these red forms to be a variety of *L. pallens*, and I think it quite probable that I have hitherto overlooked the type.—(Rev.) A. P. WALLER; Henley Rectory, Woodbridge, July 19th, 1905.

APORIA CRATÆGI.—Lovers of the Diurni will be pleased to learn that the present season has been the best I have known for the "black-veined white" since I first took it in this corner of Kent in 1901. On June 28th I went prospecting. This means discovering an orchard, with a clover field adjoining, preferably white Dutch clover, for the combination of these two things appears a requisite in order to get more than a stray specimen. I was lucky enough to capture a single male specimen which had just emerged from the chrysalis, and was quite limp, and which fell an easy prey outside an orchard of big plum-trees. On July 3rd (the first sunny day afterwards) I got to the clover field nearest the spot, and bagged sixteen. Rain and cloud kept me at home for several days, and at my next visit the clover had been cut, and this necessitated a long walk in the broiling sun, for the "combination" is not common. However, I discovered another field, where I beat record, and secured twenty-one specimens. Again the horse-mower dogged my heels, and sport was gone. A third spot was discovered, and that field produced a dozen. I had to make haste, for the driver was having his dinner preparatory to cutting, in this case, a crop of mixed red clover and lucerne. Last Monday I got a few stray specimens, but when I reached my *fifty* I decided to leave the rest in peace.—J. P. BARRETT; St. John's Villas, Margate, July 12th, 1905.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 8th, 1905.*—Mr. Hugh Main, B.Sc., President, in the chair.—Mr. Kaye exhibited a bred series of *Zonosoma pendularia*, shewing considerable variation, with pupa-cases *in situ* on the leaves, and referred to the variable position of the girth.—Mr. West (Greenwich), examples of the rarely met with *Coccinella distincta*, which he had taken at Darent Wood, together with *Mordellestina abdominalis*, a coleopteron parasitic in bees' nests.—Mr. Sich, the exceedingly small ovum of *Lithocolletis quercifoliella*.—Mr. Main, the tracheal tubes of the silk-worm, which had been dissected out by means of a solution of potash. He also shewed a case of insects from West Africa.—Mr. Step, a photograph of the party who attended the Field Meeting at Seal Chart on May 27th.

June 22nd.—Mr. Alfred Sich, F.E.S., Vice-President, in the chair.—Mr. Rayward exhibited a larva of *Thecla w-album* spun up for pupation, and also a pupa, and shewed the remarkable mimetic resemblance to a crumpled, shrivelled leaf.—Mr. Turner, a long series of *Colias eurytheme* vars., including var. *eriphyle* and var. *keewaydin*? sent to him by Mr. A. J. Croker, from Assiniboia, and read a short paper on the species and its allies. He also shewed *C. philodice*, *C. palæno*, *C. erate*, *C. hyale*, *C. edusa*, *C. electra*, *C. phicomene*, and *Meganostoma cæsonia*.—Mr. Edwards, a number of species of *Colias*.—Mr. Stonell, (1) a specimen of *Euchelia jacobæ* from Oxshott, with the apical, hind marginal, and costal streaks united; (2) a very pale *Amorpha populi*; (3) *Angerona prunaria*, females with male coloration; (4) *Boarmia abietaria* var. *sericearia*; (5) *Acidalia humiliata* from the Isle of Wight; (6) larvæ of *Nyssia lapponaria* from Rannoch; and (7) larvæ of *Apatura iris* from North Hants.—Dr. Chapman, larvæ of *Aretia villica* from ova laid by a female captured in April at Taormina, in Sicily; and also imagines of *Graellsia isabellæ* bred from larvæ taken at Bronchales, together with ova laid by them.—Mr. Adkin gave a short account of the Annual Congress of the S.E. Union of Scientific Societies held at Reigate, June 6th to 10th.—HY. J. TURNER, Hon. Rep. Sec.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*May 15th, 1905.*—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau exhibited a rare sawfly (*Schizocera furcata*, female), taken by Mr. C. J. Wainwright in Wyre Forest on May 26th, 1890. It had been named for him by Rev. F. D. Morice, who told him that only two specimens had previously been known from the British Isles. He also shewed a specimen of *Tenthredo livida*, male, which had only one antenna with the normal white tip to it, the other being quite black. He also shewed various exotic Aculeates, &c.—Mr. J. T. Fountain shewed a series of *Biston hirtaria*, Cl., bred from ova received from Yorkshire. He said that the females were decidedly later than the males in emerging (about ten days on the average). He also shewed a beautiful series of *Dianthæcia albimacula*, Bkh., from a locality he could not mention.—Mr. G. T. Bethune-Baker exhibited a collection of butterflies of the genus *Ogyris* from the Australian region, and gave an interesting account of their peculiar life-history, their association with ants, &c.—COLBRAN J. WAINWRIGHT, Hon. Sec.

THE ENTOMOLOGIST

VOL. XXXVIII.]

SEPTEMBER, 1905.

[No. 508.]

NEW AUSTRALIAN BEES OF THE GENUS *NOMIA*.

By T. D. A. COCKERELL.

TEN species of *Nomia* have been recorded from Australia, all described by F. Smith, and published in Trans. Ent. Soc. Lond., one in 1862, and nine in 1875. Smith remarked that *N. generosa* was probably the male of *N. mærens*, and I believe that *N. ruficornis* (*smithella*, Gribodo, 1894) is the male of *N. nana*; so the list probably includes only eight valid species. It is evident, however, that it does not do justice to the actual facts, for the British Museum collection contains quite a series of hitherto unreported forms, which I describe below. The Austro-Malay islands (including Celebes, the Moluccas, New Britain, the Aru islands, &c.) are rich in species of *Nomia* (twenty-one described), but, so far as I am able to ascertain, none of these are quite identical with those of Australia, nor is any species very widely spread among the islands.

The following table separates the species now described:—

Hind margins of abdominal segments pearly green; hind femora incrassate and humped above (♂)	
	<i>pulchribalteata</i> subsp. <i>austrovagans</i> , Ckll.
Hind margins of abdominal segments not so	1.
1. Tegulæ very large, light fulvous; sides of face covered with white tomentum (♀)	<i>lepidota</i> , Ckll.
Tegulæ not especially remarkable	2.
2. Tibiæ and tarsi red, the former with a suffused blackish mark in front; face covered with fulvous tomentum; abdomen with rufo-fulvous hair-bands; hind legs hardly deformed (♂)	<i>rufocognita</i> , Ckll.
Tibiæ and tarsi not red, or not distinctly so	3.
3. Black species; abdomen without well-developed hair-bands (♂)	<i>tenuihirta</i> , Ckll.
Abdomen distinctly banded with hair, or the segments whitish margined	4.

4. Black 5.
 Wholly or in part green or blue 6.
 5. Hind margins of second and following abdominal segments broadly yellowish white; second submarginal cell extremely small (♀) *semipallida*, Ckll.
 Hind margins of second and following abdominal segments not white; second submarginal cell larger (♂) *hypodonta*, Ckll.
 6. Mesothorax black (♂ ♀) *australica*, Sm., var. *reginae*, Ckll.
 Mesothorax green or blue 7.
 7. Mesothorax yellowish green (♂) *flavoviridis*, Ckll.
 Mesothorax blue or greenish blue (♂ ♀) *flavoviridis* var. *doddii*, Ckll.

Nomia (*Hoplonomia*) *pulchribalteata*, var. *austrovagans*, n. subsp.

♂. Length about 8½ mm. (the position of the specimen makes it difficult to measure); black, head and thorax with sordid yellowish-white pubescence, the scanty short hair on thorax above dark; tongue long and slender; eyes red; face very broad above, strongly narrowed below; clypeus with a keel; mandibles and antennæ black, the latter not especially long, not crenulate; vertex dullish, granulo-punctate; mesothorax dull, very densely punctured; scutellum with a pair of widely separated short (subpyramidal) spines; post-scutellum covered with white tomentum, and provided with two long black spines, much closer together than those of the scutellum; basal area of meta-thorax extremely short, with little transverse (antero-posterior) ridges; tegulae fuscous in the middle, then fulvous, and the margin white-hyaline; wings rather yellowish, the apex a little darker; stigma and nervures piceous, second submarginal cell higher than broad, but not far from square; legs black, hind tarsi and outer and apical part of hind tibiae ferruginous, the red brightest on the tibiae; hind femora swollen, strongly humped above, but not toothed beneath; hind tibiae gradually broadened to the apex, with a prominent convex keel on the outer side, but the inner apex is blunt, not toothed; abdomen black, strongly and coarsely punctured, the hind margins of the first five segments with smooth pearly light green bands, shining purple in some lights, and appearing white in others, the first band narrowest; sixth segment with a very broad and deep semicircular median emargination; apical part of venter ferruginous. The third and following abdominal segments have black hairs overlapping the bands.

Hab. Adelaide (F. Smith collection, 79. 22).

This is the first Australian *Hoplonomia*. It is very close to *N. westwoodii*, Gribodo, from Bengal, and *N. pulchribalteata*, Cameron, from New Britain; it is, in fact, so close to the latter that for the present I treat it as a subspecies. It will be known by the purple tints of the abdominal bands, resembling in this respect *N. formosa*, Sm., from Celebes.

Nomia lepidota, n. sp.

♀. Length, 7 mm. or rather more; black, the hind margins of the abdominal segments narrowly reddish; head broad, minutely

rugoso-punctate, eyes strongly converging below ; sides of face, adjacent to the eyes, with very broad bands of white tomentum, but clypeus and middle of face without this tomentum ; anterior margin of clypeus with some shining pale golden hairs ; mandibles faintly reddish in the middle ; flagellum obscure ferruginous beneath ; tubercles covered with white tomentum ; pleura with white hair, not entirely concealing the surface ; mesothorax and scutellum bare, with very large punctures ; post-scutellum entirely covered with white tomentum ; mesothorax with large punctures, its basal area reduced almost to nothing ; tegulæ very large (about three-quarters the length of mesothorax), being broadly produced backwards, light fulvous, dark only about the base of attachment ; wings slightly dusky, stigma rufous, nervures dark, second submarginal cell rather large ; legs very dark reddish, with white hair, that on inner side of basal joint of hind tarsi very pale orange ; abdomen with a thin white pubescence, but no distinct hair-bands, but on each side of the first segment is a very conspicuous patch of white tomentum.

Hab. Sydney ; F. Smith collection, 79. 22. The numbers cited are the accession-numbers of the British Museum. Readily known by the large tegulæ and bandless abdomen.

Nomia rufocognita, n. sp. (or *generosa*, var. ?).

♂. Length about 9 mm. ; black, the tibiæ and tarsi bright ferruginous, the tibiæ with a blackish spot in front ; head broad ; face covered with fulvous tomentum, occiput with fulvous hair ; mandibles simple, curved and very sharp, ferruginous, blackened at the apex ; labrum ferruginous ; antennæ very long, wholly dark, flagellum crenulated, the apical part very strongly ; hair of thorax fulvous, tubercles covered with tomentum, as also the post-scutellum, but on the latter it is white ; mesothorax and scutellum with strong close punctures of moderate size ; tegulæ ordinary, bright ferruginous, the margins subhyaline ; wings rather yellowish, ample, stigma and nervures dark reddish brown, second submarginal cell much higher than broad ; legs with thin fulvous hair ; hind legs scarcely deformed, their femora rather stout, their tibiæ flattened, the posterior edge convex, the anterior concave ; abdomen strongly and very densely punctured, with fulvous pubescence, the hind margins of the segments whitish hyaline (those of the second and third very broadly so), and having thin bands of fulvous hair ; venter simple.

Hab. Queensland, 94. 61 ; also marked 312, and what looks like Hy. Closely allied to *N. generosa*, Sm., but distinguished by the fulvous pubescence ; it may possibly be only a variety. The scutellum is gibbbose.

Nomia tenuihirta, n. sp.

♂. Length about 8 mm. ; black, even to the tarsi, the flagellum obscure brownish beneath ; front rugoso-punctate ; face covered with white tomentum, except the anterior part of clypeus, and a median longitudinal band below the antennæ, in the middle of which is a raised shining line ; mandibles black ; last antennal joint with an

oblique shining truncation; mesothorax and scutellum with extremely close minute punctures; scutellum not at all bigibbose or depressed in the middle; mesothorax with a good deal of appressed white hair, very conspicuous but not covering the surface; tubercles and post-scutellum covered with coarse white hair; basal area of metathorax reduced to a narrow band, with little transverse keels; punctures on posterior face of metathorax large; tegulae reddish brown centrally, otherwise yellowish hyaline; wings almost clear, a little dusky at apex; stigma rufous, nervures dark rufous; second submarginal cell much higher than broad, receiving the first recurrent nervure before its end; legs with white hair; spurs black; hind legs scarcely modified, the tibiae somewhat produced at apex beneath, the spurs arising from beneath the point; abdomen shining but well punctured, the punctures large on the first segment, smaller on the second, and successively smaller and fainter on the following ones; no distinct hair-bands, but a scattered white pubescence, especially on the apical half, and conspicuous erect white hair on the base and sides of the first segment; apex broadly truncate, with rounded corners; no ventral teeth, but first ventral segment raised in the middle.

Hab. Queensland, 94. 61; also labelled Ridg., and 638. Easily known from *N. argentifrons* by the normally formed hind legs and the absence of pale reddish colour on the clypeus, legs, &c.

Nomia semipallida, n. sp.

♀. Length about 8 mm.; black, the tarsi dark reddish, the claws fulvous tipped with black; head broad; eyes yellowish brown; face covered with white tomentum, which appears yellowish white and dull seen from in front, but shining snow-white seen obliquely from the side; a longitudinal keel between antennae; cheeks with yellowish-white hair, and a very narrow silvery band along the orbital margin; vertex dull; antennae wholly dark; mandibles light ferruginous with the apex black; tongue long and slender; hair of thorax white at sides and beneath, pale ochreous above, rather abundant but inconspicuous on mesothorax; post-scutellum covered with a dense band of white tomentum, and an oblique band of the same at each side of the scutellum; basal area of metathorax shining, with transverse ridges; punctures of mesothorax distinct, uniform, and very close; tegulae pale rufous, with a dark basal spot; wings dull hyaline, iridescent, stigma and nervures rufous, second submarginal cell very small and narrow, receiving the first recurrent nervure before its end; marginal cell bluntly rounded at end; legs with white hair; spurs ferruginous; abdomen broad, rather shining, rugoso-punctate, the first segment rounded, and with much erect white hair; hind margins of second and following segments broadly whitish hyaline, not provided with well-defined hair-bands; ventral segments also white-margined.

Hab. Queensland, 91. 16; also labelled 315 Hy. Easily known by the whitish margins of the abdominal segments.

Nomia hypodonta, n. sp.

♂. Length about 8 mm.; black, the abdomen blue-black, with the hind margins of the segments pure black; pubescence of head and

thorax white, a little yellowish on face, vertex, mesothorax, and scutellum; the mesothorax and scutellum, seen from above, look bare, but viewed from the side they are seen to have rather abundant short fuscous hair; mandibles black, ferruginous at apex; labrum shining black, strongly emarginate; vertex granular; antennæ long and slender, entirely black, third joint shorter than fourth; mesothorax dullish, minutely granulo-punctate; post-scutellum with a delicate white tomentum; sides of metathorax with a large patch of loose white fluff; basal area of metathorax rather large, shining, with numerous raised lines or keels, its hind margin in the middle with a pair of rounded excavations; tegulæ rather large, deep red-brown, the inner hind angle pointed; wings hyaline, the apical margins faintly dusky, stigma and nervures fuscous; second submarginal cell higher than broad, but not small, receiving the first recurrent nervure at its apical corner; legs black, with white pubescence, the basal part of the claws ferruginous, the spurs light ferruginous; second to fourth joints of anterior tarsi triangular; hind femora extremely swollen and convex above, beneath with a concave area, flattened in a transverse direction; hind tibiæ much thickened, with a large and a small tooth beneath towards the base, and the spur-bearing apical lobe incrassated; abdomen minutely roughened, with a subsericeous surface, the apical margin of the first segment minutely punctured, and having a little patch of white hair at each extreme side; the apical margins of the second and following segments with bands of pure white hair, but that on the second is extremely widely, that on the third rather widely, and that on the fourth slightly, interrupted; third ventral segment with a pair of prominences, each terminating in a short sharp spine; fourth ventral segment emarginate, with the hind lateral angles pointed.

Hab. Queensland (E. Saunders), 93. 49; also marked Hy, 308. Close to *N. dentiventris*, Sm., but the pubescence is of a different colour, the hind femora do not present a large swelling beneath, and the ferruginous colour on the legs is lacking.

Nomia australica, Sm., var. *reginæ*, n. var.

♀. Length about $11\frac{1}{2}$ mm.; flagellum ferruginous beneath; scape dark rufous; face with a slender keel or raised line extending from level of antennæ to apex of clypeus; clypeus all black, the anterior part shining, with very large punctures; tongue dagger-shaped, very broad at base; mesothorax shining black, with large scattered punctures, and very minute close ones; tegulæ testaceous and subhyaline, fuscous basally, fulvous in the middle; second submarginal cell almost square; abdomen dark blue, the broad hind margins of the second to fourth segments brass-colour, with hair-bands which are fulvous except laterally, where they are white; the hair-band on the second segment is entire, but thin in the middle; spurs black, those of hind legs curved at apex.

♂. Mesothorax very densely and quite strongly punctured, the punctures not of two sizes; anterior part of clypeus whitish hyaline, the extreme edge ferruginous; truncate process on hind tibiæ not so long as Smith figures for the type.

Hab. Queensland; one female, five males. The female is

marked E. Saunders, 93. 49, and 317. The males are marked as follows: (1.) 91. 16, Hy. 316; (2.) 91. 16, 317; (3.) E. Saunders, 93. 49, 317; (4.) same as 3; (5.) F. P. Dodd, 1902. 319; Townsville, 22. 10. 01.

The Adelaide form of this insect is to be considered the type; Smith himself remarked on the geographical variation of this species. The Queensland race is readily distinguished in the female by the wholly dark clypeus and the entire hair-band on the second abdominal segment.

Nomia flavoviridis, n. sp.

♂. Length about $7\frac{1}{2}$ mm.; head and thorax dull yellowish green; abdomen blue-green (largely blue on first segment), with the hind margins of the second and following segments broadly yellow-green, or the yellow-green colour may suffuse the segments broadly; vertex and mesothorax granulo-punctate; face and cheeks covered with snow-white hair, that on vertex dull pale yellowish grey; antennæ long, flagellum dull brown beneath; anterior part of clypeus pale yellowish hyaline, the edge ferruginous; apical half of mandibles dark ferruginous; tongue dagger-shaped; hair of mesothorax and scutellum yellowish fuscous, not conspicuous, hind edge of mesothorax with two patches of white tomentum; post-scutellum covered with white tomentum; a large patch of white hair on each side of metathorax, and hair of pleura white; area of metathorax rather large, covered with ridges, the posterior margin at middle with two slight excavations (as in *N. hypodonta*, but less marked); tegulæ rufo-fulvous, the inner hind angle pointed; wings clear, stigma sepia brown, nervures dark brown; second submarginal cell nearly square, first recurrent nervure meeting second transverse-cubital; legs with white pubescence; femora metallic green, the knees ferruginous; tibiæ ferruginous with more or less green suffusion; tarsi entirely ferruginous; spurs white; hind femora swollen; hind tibiæ broadened, long-triangular, the inner edge sharply keeled; hind margins of abdominal segments with white marginal bands, that on first represented only by a patch on each extreme side; venter not dentate.

Hab. Queensland, 91. 16; two specimens, both numbered 434. Distinguished from *N. ænea*, Sm, by its strongly metallic colours, the stouter femora, and the pure white abdominal hair-bands.

Nomia flavoviridis var. *doddii*, n. var.

♂. Length about 7 mm.; dark blue, with the third and following abdominal segments olive-green; legs coloured as in *N. flavoviridis*, the tarsi variable, sometimes dark, sometimes quite bright ferruginous; tongue dagger-like; second submarginal cell square, the first recurrent nervure meeting second transverse-cubital.

♀. Length about $7\frac{1}{2}$ mm.; head, thorax, and abdomen entirely dark blue; apex of abdomen fringed with pale chocolate hair; anterior half of clypeus black; legs very dark rufo-fuscous; mesothorax with minute punctures, and scattered larger ones, in the manner of *N. australica*.

Hab. One female, Parry Harbour, C. Bougainville, 92. 4; six males, Townsville, Queensland, 8. 12. 01 (F. P. Dodd); 1902. 319. The colour is uniformly very different from that of *N. flavoviridis*, but there are no satisfactory structural characters.

Nomia rubroviridis, n. sp.

♀. Length about 10½ mm., rather broad; black, the hind margins of the first four abdominal segments with very broad entire emerald-green bands, the first two being suffused on their anterior half with vermilion; the fifth segment has a dense fringe of ochreous hair, and the apical segment is covered with the same. Sides of face, area between antennæ, cheeks, prothorax including tubercles, pleura, post-scutellum, and nearly all of metathorax covered with coarse sordid-white, more or less tinged with ochreous; a delicate raised line extends down middle of face to apex of clypeus; antennæ dark; mandibles with the subapical region dark red, the apex feebly bidentate; mesothorax dull, with dense small punctures; scutellum also dull, slightly depressed in the middle, but not tuberculate or spined; *post-scutellum with a prominent bifid median process, directed backwards, having much the shape of a fish-tail*; tegulæ large, the inner hind corner pointed, the base fuscous, the middle ferruginous, the outer hind part broadly creamy white; wings somewhat dusky, stigma and nervures dark rufo-fuscous; second submarginal cell fairly large, a little higher than broad, receiving the first recurrent nervure much before its end; legs black, with pale pubescence; *anterior spur of hind tibia longer than the other, stout and nearly straight, with a little divergent reddish spine arising from the side of its apex*; hind spur curved, simple; black parts of abdomen dull, only moderately punctured; hind margins of ventral segments dark and fringed with hair.

Hab. Australia, north-west coast; 69. 50. A very distinct and beautiful species, superficially resembling a small *Anthophora* of the *zonata* group, with which, in fact, I had accidentally mixed it. It is not precisely a *Hoplonomia*, but it is probable that the diagnosis of that group should be modified to permit its inclusion. In the colour of the abdominal bands it strongly recalls *N. opulenta*, Sm., and *N. elegans*, Sm., from Morty Island and Celebes respectively.

Boulder, Colorado: May 7th, 1905.

DESCRIPTION OF A NEW SPECIES OF *PSEUDAGENIA*
(HYMENOPTERA—POMPILIDÆ) FROM NATAL.

By P. CAMERON.

PSEUDAGENIA NATALENSIS, sp. nov.

Black, the prothorax, except the sternum, mesonotum, scutellum, the mesopleuræ above the oblique furrow at the base and slightly below it, the post-scutellum and a line on either side of it, reaching to the pleuræ, rufous; the sides of the first abdominal segment testaceous,

the four anterior knees testaceous; the fore tibiæ and tarsi obscure white behind; the calcaria and the apical segment of the abdomen, clear white; wings hyaline, a cloud along the transverse basal and transverse median nervure, one in the basal third of the radial cellule, extending into the cubital cellule below, occupying it, except the lower basal corner, and into the upper apex of the discoidal cellule, where it becomes fainter; and there is a faint cloud in the apex of the wings. ♂. Length, 7 mm.

Covered with a silvery pubescence; the apex of the clypeus narrowly white, broadly rounded. Hind ocelli separated from each other by a distinctly less distance than they are from the eyes, which converge above where they are separated by about the length of the second and third antennal joints. Palpi black. Apex of pronotum arcuate, narrowly edged with yellow. The second abscissa of radius is about one-fourth shorter than the third; the first transverse cubital nervure is roundly curved; the second is straight, obliquely sloped; the first recurrent nervure is received at the apex of the basal third of the cellule; the accessory nervure in hind wings is received shortly behind the transverse median. The long spur of the hind tibiæ is half the length of the metatarsus.

Bassus letatorius, Fab., IN CAPE COLONY.—This common British ichneumon I find in the collection of the South African Museum from Cape Town, where it has been taken so far back as 1874. It has now been found in nearly every part of the globe and in many of the islands. It would be interesting to know what its host may be outside Europe. Probably some equally cosmopolitan dipteron.

A NEW *STEGOMYIA* FROM THE TRANSVAAL.

By FRED. V. THEOBALD.

STEGOMYIA SIMPSONI, nov. sp.

Head black, with a median white area and white at the sides. Proboscis black, unbanded. Thorax deep brown with a large silvery-white anterior lateral patch, a smaller one behind just before the root of the wing, a small silvery median spot close to the head, two yellowish median parallel lines, a short silvery one on each side over the smaller lateral patch, a silvery line on each side of the bare space in front of the scutellum. Scutellum with silvery-white scales in three patches. Pleuræ with white puncta. Abdomen blackish with basal silvery-white bands. Legs basally banded white.

♀. Head clothed with black scales except for a median white area and grey lateral areas, a few white scales bordering the eyes. Antennæ deep brown, the basal segment black with a patch of silvery-white scales on the inside; clypeus and proboscis black. Palpi black-scaled with white-scaled apices. Thorax black, clothed with bronzy, broad elongate curved scales and ornamented with a large patch of broader silvery-white scales on each side in front, a smaller patch on each side

just before the roots of the wings, and a small white median spot near the head, from which run two parallel dull yellow median lines to the bare space in front of the scutellum, and a short silvery line on each side over the roots of the wings; the sides of the bare space in front of the scutellum bordered with white. Prothoracic lobes with flat white scales. Scutellum with the large median lobe black-scaled, with a prominent border of silvery-white ones, lateral lobes with large flat white scales, border-bristles brown. Metanotum deep brown. Pleuræ deep brown with prominent silvery-white puncta. Abdomen deep blackish-brown with silvery-white basal bands, except the first segment, which is all deep brown with pallid bristles, large basal lateral white spots to each segment; posterior border-bristles brown, inconspicuous. Legs with the anterior femora and tibiæ black, metatarsus and first tarsal with broad basal white bands, last three tarsi black, a trace of a pale basal area on the tibia; in the mid legs the femora are pale at the base and have a small round white spot towards the apex which is white, remainder as in the fore legs; hind legs with the femora white along the basal half, an oval elongate silvery-white spot towards the apex, the latter snowy white, base of metatarsus and first and second tarsi broadly white-banded, third tarsus all black, fourth pure white. Ungues all equal and simple. Wings with the first submarginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior, its stem about one-third the length of the cell, stem of the second posterior cell about as long as the cell; posterior cross-vein about two and a half times its own length distant from the mid cross-vein; the median vein-scales on the fifth, where the branch arises, in two prominent lines. Halteres with pallid base and dusky scaled knobs. Length, 3.5-4.5 mm.

♂. Thoracic adornment similar to that of the female. Palpi black with a white patch at the base of the two apical segments on one side only, that at the base of the apical one largest, and a broader white band towards the base, and another small one still nearer the base; the two apical segments nearly equal, the apical one slightly the shorter, both and the apex of the antepenultimate with long scattered brown hairs, apical segment rounded at the tip. Antennæ with deep brown plume hairs and pale internodes. Abdomen and legs as in the female. Fore and mid unguis unequal, simple, the larger one in the fore pair rather more curved than the larger of the mid; the hind pair small, thick, curved, and equal. Claspers of male genitalia shortish and rather broad, straight on one side, curved on the other, with a very small nearly terminal dark process; between the basal lobes a large spine with expanded base. Length, 3.5-4.5 mm.

Habitat.—Transvaal (collected by Mr. Simpson, Government Entomologist).

Observations.—Evidently common from the large number sent in a collection forwarded by Mr. Simpson. It superficially resembles *S. fasciata*, but the thoracic ornamentation, the simple female unguis, the different adornment of the male palpi at once separate it. The female palpi are composed of three segments, of which the apical is very marked, being suddenly contracted at the tip and ends in a round truncated surface.

A NEW RACE OF *MORPHO ADONIS*, CRAM.

BY PERCY I. LATHY, F.Z.S., F.E.S.

MORPHO ADONIS var. MAJOR, NOV.

♂. Much larger than typical *M. adonis*, measuring 32 millim. more than the largest specimen in Mr. Adams' series; the white markings on costa of fore wings above larger and a submarginal row of white spots, in this respect approaching ab. *adonides*, Stgr.; the wings of a deeper blue and not so silvery as in *adonis*. Under side with the pale bands silvery.

♀. Also much larger than typical *adonis*, and the pale yellow markings reduced.

Exp. ♂, 148-152 millim.; ♀, 160 millim.

Hab.—La Merced, Peru; 2500 ft.

I received two males and one female of this very beautiful form of *M. adonis* from Mr. H. Watkins, my collector in Peru; the three specimens are now in the collection of Mr. Herbert J. Adams. One of the two males has traces of a second row of submarginal spots.

THE LEPIDOPTERA OF BERLIN.

BY E. M. DADD, F.E.S.

(Concluded from p. 212.)

. DURING the latter part of August very little entomological work was done. An outing to Bernau found the heather just commencing to bloom, and a piece of waste ground overgrown with thistles proved to be very productive. *Lycæna argus* and *L. ægon* were both abundant, the males easily distinguished by the breadth of the black border to the wing; the females practically indistinguishable. Several *ægon* var. *unipuncta* were among the captures; besides these two interesting "blues," *Chrysophanus virgauræa*, *L. dorilis* (two females), *C. phlæas*, *Hesperia thaumas*, *H. lineola*, *Epinephele lycaon*, *Satyrus semele*, *S. alcyone*, *Argynnis latona*, and *Thalera fimbrialis* were obtained. The last-named is an especially fine "emerald," and the two specimens I obtained were in the pink of condition. *Rhodostrophia vibicaria* was obtained in the pine woods, but mostly worn.

A week later, at Potsdam, *Erebia aethiops* and *Colias hyale* were the only new species.

Sugaring was of very little use during the latter part of August and commencement of September. *Catocala sponsa*, *C. promissa*, and *Amphipyra pyramidea* came to sugar in oak woods. An avenue of all sorts of trees along a country road was more productive, *Acronycta menyanthidis*, *A. rumicis*, *A. megacephala*,

A. auricoma, *Dychorista suspecta*, *Agrotis vestigialis*, *A. baia*, *Hadena scolopacina*, *H. monoglypha* and dark vars. being obtained.

About the middle of September sugaring again became productive, and we sugared the ground at Buch and Schulzendorf alternately with great success until about the middle of October, when bad weather set in. *Acronycta rumicis*, *Agrotis pronuba*, *A. c-nigrum*, *A. xanthographa*, *A. plecta*, *A. nigricans* (worn), *A. tritici* (worn), *A. ypsilon*, *A. segetum*, *Charæas graminis*, *Epineuronia popularis*, *E. cespitis* (more to the lamps), *Mamestra oleracea*, *M. dissimilis*, *M. trifolii*, *Calena haworthii*, *C. matura*, *Hadena porphyrea*, *Aporophyla lutulenta*, *Ammonoconia cæcimacula*, *Dichonia aprilina*, *Dryobota protea*, *Brotolomia meticulosa*, *Nænia typica*, *N. jaspidea*, *N. celsia*, *Hydræcia nictitans*, *Tapinostola fulva*, *Leucania pallens*, *L. album*, *L. albipuncta*, *Caradrina ambigua*, *Amphipyra tragopogonis*, *Orthosia lota*, *O. circellaris*, *O. helvola*, *O. nitida*, *O. lævis*, *O. litura*, *Xanthia citrigo*, *X. lutea*, *X. fulvago*, *X. ocellaris* and var. *lineago*, *Orrhodia erythrocephala* and var. *glabra*, *X. vaupunctatum*, *X. vaccinii*, *O. rubiginea*, *Scopelosoma satellitia*, *Xylina socia* (*furcifera*), *X. ornitopus*, *Calocampa vetusta*, *C. exoleta*, *C. solidaginis*, *Catocala fraxini*, and *C. nupta*. *Luceria virens* was not unfrequent at rest on grass-stems in pine woods, and by the aid of an acetylene lamp a fair series of this beautiful insect was captured. *Eupithecia sobrinata* swarmed on the street-lamps, as also one worn *Dendrolimus pini*. *Ennomos angularia* and *E. autumnaria* were frequently netted.

Very little was to be done during the daytime; butterflies were as good as over, only *Vanessa antiopa*, *V. io*, *V. urticae*, *Grapta c-album*, and *Argynnis lathonia* still being worth capturing. In the pine woods *Larentia* var. *obeliscata* was fairly common, and occasional larvæ of *Macrothyralacia rubi* were picked up.

Beating *Rhamnus* was fairly productive; full-fed larvæ of *Eupithecia abbreviata*, *Macaria alternata*, and *Cyaniris argioides* were obtained. Heather produced larvæ of *Eupithecia nanata*, *E. goossensiata*, *Anarta myrtili*, *Acronycta menyanthidis*, and *Nemeophila sanio*.

DESCRIPTION OF A NEW SPECIES OF GASTERUPTION (EVANIIDÆ) FROM CAPE COLONY.

By P. CAMERON.

GASTERUPTION LISSOCEPHALUS, sp. nov.

Black, the mandibles, four anterior femora, tibiæ and tarsi, and the narrowed basal part of the hind tibiæ, and the apices of the second, third, and fourth abdominal segments broadly, rufous; wings hyaline, the stigma and nervures, testaceous. ♂. Length, 11 mm.

Head shining, the front and vertex smooth, the former with a deep furrow on its upper half; the face and clypeus closely, but not strongly punctured, covered with a white down. Apex of clypeus with a round wide incision. Malar space distinct, fully as long as the second antennal joint. First antennal joint slightly shorter than the third, about one-third longer than the second, which is twice longer than wide; the fourth slightly, but distinctly longer than the third. Temples shorter than the eyes; abruptly, obliquely narrowed behind; the occiput roundly incised. Collar very short, keeled down the middle; irregularly reticulated. Mesonotum irregularly rugosely punctured, the centre at the base finely closely transversely striated; the sides closely punctured. Scutellum closely punctured, its apex irregularly reticulated and bounded by two curved keels laterally. Metanotum transversely reticulated; more distinctly in the centre than on the sides; the middle with a fine distinct longitudinal keel. Propleuræ irregularly striated above, sparsely punctured below. Upper part of mesopleuræ irregularly punctured and striated, the rest and the metapleuræ closely longitudinally rugosely punctured. First abdominal segment finely closely rugose, as long as the following two segments united. Hind metatarsus somewhat shorter than the four following joints united; covered below with a dense fulvous pile. Anterior discoidal cellule narrowed sharply at the apex; longish; the posterior is shorter than it, being clear of its base and apex. Hind coxæ closely distinctly punctured, the punctures running into striæ towards the apex.

The head and collar are shorter, and the mesonotum more coarsely distinctly rugosely punctured-reticulated than in any of the African species known to me.

LEPIDOPTERA COLLECTED IN CENTRAL AMERICA.

BY ARTHUR HALL.

DURING the summer of 1904 I made an entomological trip to Central America, spending some six weeks in Southern Mexico, about the same time in Western Guatemala, and a month in Costa Rica. The results were fairly successful, nearly seven hundred species of Rhopalocera being obtained. The following were among the most interesting of those met with:—

Papilio asclepius, Hübn.—This fine species is not uncommon at Cuautla, Mexico, at an elevation of about 4000 ft. It frequents gardens on the borders of the town, and is fond of flying at a great height round the tall mango trees which abound there.

P. pharnaces, Doubl., is peculiar to the Mexican plateau and was not uncommon in the State of Oaxaca in June. It has a curious habit of flying with great rapidity round in a circle, and very seldom settles.

P. americanus, Kolt.—A number of specimens were bred in Costa Rica, from larvæ feeding on the leaves of orange.

Archonias tereas, Godt.—Appears to mimic *Papilio mylotus*, which it resembles in flight and habits.

Eurema mexicana, Bois.—A specimen with the fore wings entirely black was captured at Orizaba, Mexico.

E. westwoodii, Bois.—In the drier parts of Mexico this species and several others of the same genus congregate in damp cavities in the rocks, where as many as a hundred may sometimes be found together.

Perrhybris viardi, Bois., was found only on the Pacific slope of Guatemala. The male is of the usual Pierid pattern, but the rare female mimics the common *Heliconius charitonia*, L., for which I at first mistook it.

Kricogonia lyside, Gdt., which was common at Salina Cruz, Mexico, and in parts of Guatemala, has a habit of hiding in thick bushes, from which it may be driven out by beating. An entirely yellow aberration of the female was not uncommon.

Clothilda insignis, Salv.—A specimen was found near the summit of the volcano of Cartago in Costa Rica, at an elevation of nearly 12,000 ft.

Microtia elva, Bates.—A local race occurring at Salina Cruz, Mexico, has the fulvous markings much more extensive than in the typical form.

Chlosyne hyperia, Fabr.—This species, which was very abundant in the State of Morelos, Mexico, shows much less variation than some of its allies, but several specimens have a large red blotch on the hind wings, thus forming a transition to *C. janais*, Dru. The latter species, although abundant in many places, was not found in the same localities.

C. gaudialis, Bate.—An extraordinarily local species. It was abundant in one field at Escuintla in Guatemala, but not another specimen was seen nearer than Mazatenango, 170 miles distant, where it was again abundant.

Pyrameis atalanta, Linn.—This old familiar friend was found at Orizaba, Cuautla, and Cuernavaca, in each case at an elevation of about 4000 ft. In the last-named locality *Vanessa antiopa* also was met with.

Junonia cœnia, Linn.—In the table-land of Western Mexico I obtained specimens of a melanic form, some having the upper side almost entirely black.

Bulboneura sylphis, Bates.—Met with only in the State of Guerrero, Mexico, where it was rare. It is fond of settling on the rocky sides of the cañons.

Catagramma pitheas, Latr.—Specimens from the Pacific slope of Guatemala have much more red on the hind wings than Colombian examples.

Ageronia atlantis, Bates.—Occurs in the States of Oaxaca and Guerrero, Mexico, but very scarce.

Ectima liria, Fabr.—Rather common in Costa Rica. It settles on tree-trunks, with the wings expanded after the manner of the *Ageronias*.

Adelpha demialba, Butl.—This curiously marked species is peculiar to Costa Rica. It is apparently a mimic of *Megalura merops*, Bois.

Smyrna karwinskii, Hübn.—Common in Southern Mexico. It much resembles the *Vanessæ* in its habits, having a partiality for fruit-trees, sunny walls, and gardens, and will also come to sugar. It will conceal itself under the leaves of bushes and fly out suddenly on being approached.

Anæa callidryas, Feld.—Three specimens were obtained in different localities in Western Guatemala. It cannot be distinguished from a white *Catopsilia* when on the wing, a fact which may partly account for its rarity.

A. elara, Godm. & Salv., Trans. Ent. Soc., 1897, p. 244.—Two pairs of this, the largest of the "green" *Anæas*, at Carrillo, in Costa Rica. The female is tailed, as Messrs. Godman and Salvin rightly assumed.

Zaretis ellops, Mén.—The female of this species, which is common in Guatemala, undoubtedly mimics the same sex of *Catopsilia eubule*, L.

Hypna iphigenia, H.S.—A specimen of this Cuban species was taken on the Isthmus of Tehuantepec.

Siderone ide, Hübn.—Two specimens, taken at Escuintla, Guatemala, do not differ in any respect from the Colombian form.

Protopogonius cecrops, Doubl. & Hew.—Evidently a mimic of *Lycorea atergatis*, Doubl. & Hew. Both species fly together in the same localities in Guatemala and Costa Rica, and are difficult to distinguish on the wing.

Morpho polyphemus, Doubl. & Hew.—Widely distributed in Southern Mexico, but scarce. It has a very slow, graceful flight, but generally keeps twenty or thirty feet above the ground.

M. octavia, Bates.—Not uncommon on the Pacific slope of Guatemala, but extremely local. I found it from sea-level up to an elevation of nearly 4000 ft. Unlike most species of the genus it flies close to the ground, but its flight is rather fast and very erratic.

M. cypris, Westw.—Met with near Santo Domingo, on the Pacific slope of Costa Rica; rare.

Caligo memnon, Feld.—Common at Escuintla and other parts of Guatemala. During rain it often comes into houses, apparently for shelter.

Lymnas acroleuca, Feld.—Common in the State of Morelos, Mexico, where it evidently mimics an abundant moth of the genus *Melanchroia*.

Mesene macularia, Bois.—A little butterfly which is exceed-

ingly like the common European *Venilia maculata*, L. in size and colouring. It occurred in Costa Rica, but was scarce.

Pythionides sallei, Feld.—This is the most interesting of the one hundred and sixty species of Heperidæ obtained. My specimen was taken at Escuintla, Guatemala, and one was seen at Cuautla, Mexico; as it is recorded from Eastern Peru, its range would seem to be very extensive.

Thysania agrippina, L.—This giant Noctuid, one specimen of which is ten inches in expanse, was captured at Old Guatemala, a locality which must be very near the most northern limit of its range.

In conclusion I may remark that the comparative scarcity of Lepidoptera at moderately high elevations was very striking, and difficult to explain. At upwards of 5000 ft. very few species were to be found, whilst above 7000 ft. a few small Lycaenidæ alone were met with, despite the fact that the vegetation is luxuriant up to an elevation of above 10,000 ft. Neither the Alpine species of the Neoarctic region, nor the Andean forms of Colombia and Peru, have more than a few isolated representatives in Central America.

June 24th, 1905.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA OR RHYNCHOTA).

BY G. W. KIRKALDY.

(Continued from p. 178.)

THE Corixidæ form a well-marked group, which has sprung, apparently, from a Naucoroid stem. They are characterized by the narrow, somewhat flattened form, the obscurely segmented rostrum,* modified anterior legs, &c. The head is strongly deflexed, and varies in form in the sexes, except in *Micronecta*. The pronotum is usually large, the anterior margin being more or less concealed by the posterior margin of the vertex, while its posterior margin conceals all but a very small part of the

* Börner ("Zur Systematik der Hexapoden," 1904, in Zool. Anzeiger, xxvii. 522) has instituted a special suborder—Sandaliorrhyncha—for the Corixidæ, on account of the short obscurely segmented rostrum, deeming it a link between the Homoptera and the Heteroptera. This is far from correct, the Corixidæ being, as Handlirsch properly points out ("Zur Systematik der Hexapoden," 1904, in Zool. Anzeiger, xxvii. 746), a terminus of one of the heteropteral lines. The rostrum is merely a protecting sheath for the piercing and sucking organs, and has no functions, apparently, as a pump. In certain terrestrial forms with flexible rostrum (Miridæ, &c.) the living bug may be seen bending its rostrum at the junction of the second and third segments, at more or less of an acute or obtuse angle, according as the bug desires to pierce more or less deeply into the food substance.

scutellum, except in *Micronecta*, where the scutellum is almost entirely exposed. The tegmina (elytra) are usually ornamented with more or less regular, vermiculate or straight, transverse lines, these being often broken up into series.* In *Micronecta*, &c., there are few markings, these being generally more or less longitudinal and generally more or less obscure. In *Micronecta*, *Cymatia*, and *Corixa*, the tegmina, and also the pronotum, are more or less smooth and polished, sometimes punctured; but in the other genera these parts are either partly, or wholly, very finely rastrate (*i. e.* striated like a file, this character being seen best in an oblique position). The anterior legs and their stridulatory areas have already been described and figured by me †; the intermediate legs are long and slender, and are terminated by two long claws; the proportionate lengths of these parts form good secondary characters for the discrimination of certain species. The posterior legs are modified for swimming, even more than are those of the Naucoridæ; they are flattened, dilated, and thickly fringed with ciliate hairs.

In the females the abdominal segments are regular, but in the males are broken up and disordered. The asymmetry is to the left in *Corixa*, to the right in all the other genera. The *strigil* has been discussed in my paper cited last.

Although the Corixidæ are so well known and have so often been dealt with systematically, their biology has been little studied in detail.

The whitish ova of *Corixa geoffroyi* are to be found in any suitable piece of water from March onwards to June attached to the stem or leaves of various pondweeds by means of a glutinous substance; the pedicle seems to be extensile. They are more or less onion-shaped, the apical end being drawn out into a point. They have been briefly described and figured by Dufour (p. 350, pl. xvi. f. 186, under the specific name of *striata*), and by Leuckart (1855, Müller's Archiv. pl. viii. f. 23, as *Coriza (!) striata*). The internal development of the egg has been studied by Metshnikov at some length (1866, Zeitschr. Wiss. Zool. xvi. pp. 129 and 422-36, pls. 26 and 27 A); a very brief *précis* is given by Packard (1898, 'Text-book of Entomology,' fig. 493). Leuckart also describes the egg of *Arctocorisa nigrolineata*, while Dufour describes that of *A. lateralis* (*hieroglyphica*, Duf.) as being pointed, elongate oval (fig. 187). The ova of *A. mercenaria* have been for centuries used for food by the Mexicans; while an Egyptian species, un-

* This pattern is not modern, being well shown in "*Corixa elegans*," Schlechtendal (1894, Abh. Naturf. Ges. Halle, xx. 216; pl. xiii. f. 4), from the Aquitanian (Kainozoic) formations of the Siebengebirge in Germany.

† See "The Stridulation of *Corixa*" in Entom. xxxiv. 9 (1901), and "The Stridulating Organs of Waterbugs (Rhynchota), especially of Corixidæ" in Journ. Quekett Micr. Club (2), viii. 38-46, pls. 3 and 4, where other papers are referred to.

described, has been mentioned by Motschulsky as being utilized for similar purposes. I have discussed this at some length, and have also figured an egg of *A. mercenaria*.*

The nymphal stages are not specially remarkable. De Geer (tom. 3, pl. 20, figs. 16 and 17) figures some, but modern detailed figures are needed. The metamorphosis of the Corixidæ takes some three months or so, or perhaps less; the species all hibernate in the adult stage except (according to F. B. White) those of *Micronecta*.

The Corixidæ have a distinctly "buggy" smell—and taste! Dufour says that they are carnassial: I think that small worms, *Rotifera*, &c., form a large part of their food. The internal anatomy is described by Dufour, also by Burmeister (1835, *Handb. der Entom.* ii. 186), for *punctata* (i. e. *geoffroyi*).

The Corixidæ breathe in a peculiar manner, which has been well described † by A. S. Packard, whose recent death everyone will deplore. The Corixid "takes in the air so suddenly that it is impossible without long and patient observation to see the mode, which we have been unable to find described. It rises to the surface in a horizontal position, and no sooner is the surface reached than it darts to the bottom, and in one instance remained there for ten minutes by the watch, and then darted up again, leaving an air bubble in its wake, which rose to the top afterwards. It carries down with it a broad silvery streak along the side of the body. The air is really introduced under the head and front thorax. The head is large and very movable, as well as the prothorax. It slides back and forth on a thin membrane, from the surface of which it can be raised. So with the hinder edge of the prothorax, which rides over the membranous hind thorax, which it nearly conceals. When the *Corixa* rises to the surface it floats in a horizontal position, the hind edge of the head and the prothorax rising slightly above the surface. Now slightly raising the back of the head and the hind edge of the prothorax, a space appears in front of and behind the prothorax, by which the air passes into the breathing-holes beneath. This is proved by the small bubbles of air remaining in these two cracks. Two minute spiracles may be detected in deep pits, one on each side, just above the insertion of the legs, and from which the tracheæ arise, each one dividing into three irregular short branches, as may be seen by detaching the segment and holding it up to the light."

Corixidæ are often used as hosts by Hydrachnid larvæ, which are attached as in the Naucoridæ. Ouchakoff describes, but

* See "An Economic Use for Waterbugs" in *Ent. Mo. Mag.* (2) ix. 173-5 (1898), and "Sur quelques hémiptères aquatiques nouveaux ou peu connus" in *Revue d'Entom.* 1899, p. 95, and fig. 6.

† "Half-hour Recreations in Natural History—Half-hours with Insects," p. 141.

does not name, a form found on *C. geoffroyi* (as *striata*),* but his note is of little value.

Six genera of Corixidæ are British, and may be separated as follows:—

Males.

1. Minute species; scutellum covered by pronotum only at anterior margin; face convex; [strigil present] (1) *MICRONECTA*, Kirkaldy.
- 1 *a.* Larger species; face excavated; scutellum more or less membranous, concealed, except at posterior angle, by the pronotum 2.
2. Strigil present 4.
- 2 *a.* Strigil absent. 3.
3. No stridular area; posterior tarsus not marked with black (2) *CYMATIA*, Flor.
- 3 *a.* Stridular area present; posterior tarsus marked conspicuously with black [the tarsal segment itself, not the hairs only] (4) *CALLICORIXA*, White.
4. Palar stridulator composed of pegs ranging in form from short peg-top shape to bristly, the transition gradual (3) *GLÆNOCORISA*, Thomson.†
- 4 *a.* Palar stridulator composed of more regular pegs, never bristle-like, although elongate 5.
5. Asymmetry to right. Pronotum and tegmina more or less rastrate (5) *ARCTOCORISA*, Wallengren.
- 5 *a.* Asymmetry to left. Pronotum and tegmina smooth, shining (6) *CORIXA*, Geoffroy.

Females.

1. Face flattened 2.
- 1 *a.* Face convex 3.
2. Shining, smooth; pronotum without markings (2) *CYMATIA*, Flor.
- 2 *a.* Rastrate, dull; pronotum with impressed transverse lines (3) *GLÆNOCORISA*, Thomson.
3. Scutellum not covered, except at anterior margin, by pronotum (1) *MICRONECTA*, Kirkaldy.
- 3 *a.* Scutellum concealed, except posterior angle, by pronotum 4.
4. Pronotum and tegmina smooth, shining (6) *CORIXA*, Geoffroy.
- 4 *a.* Pronotum and tegmina more or less rastrate 5.
5. A conspicuous black spot on posterior tarsus (4) *CALLICORIXA*, White.
- 5 *a.* Posterior tarsi pale, fringing hairs often black (5) *ARCTOCORISA*, Wall.

* "Notice sur un Insecte parasite" in Bull. Soc. Imp. Nat. Moscou, vii. 392 (1834).

† The chief generic character in this is that in the female the face is flattened.

MICRONECTA, Kirkaldy.*

(=*Sigara* of some former authors.)

Face convex in both sexes. No apparent stridular area on anterior femora. Palæ subovate, terminated by a powerful knife-shaped claw (in the male), which is jointed with the pala and is turned right back, in repose, into an excavation in the pala; on the pala there are only bristly hairs. In the female the palæ are elongate cultrate. A character separating this genus from all the other British genera is that the metapleura are simple, while in the others they are deeply impressed posteriorly, so deeply in fact that Fieber mistook the impression for a true suture, and termed the posterior lobes the "parapleura." The venation of the wings is also much simpler.

Little is known of the habits of *Micronecta* beyond the fact that it stridulates. F. B. White states that it hibernates in the nymphal instars †; and Westwood ‡ has described *M. ovivora* (as a *Corixa*) from the Canara River, Madras, naming it from its supposed destructive habits of devouring fish ova.

There are two British species:—

1. Length, $1\frac{1}{2}$ –2 mill.; pronotum nearly as long as vertex; the lateral margins of the former longer than half the posterior margin of an eye (1) *minutissima* (L.).
2. Length, 2–2 $\frac{1}{3}$ mill.; pronotum much shorter than the vertex; lateral margins of the former scarcely perceptible (2) *scholtzii* (Scholtz).

1. *M. MINUTISSIMA* (Linné).

This species is the *Notonecta minutissima* of Linné, the *Sigara minuta* of Fabricius, and the *S. lemana* of Fieber. A slight variety is the *S. poweri* of Douglas and Scott. It is figured by Douglas and Scott, by Saunders, by Herrich-Schaeffer (1850, Wanz. Ins. ix. pl. 295, f. 907), and by Fieber (1845, "Entomologische Monographien" in Abh. böhm. Ges. Wiss. (5) 3, pl. 1, figs. 11–19). Further figures may be found in Duda's "Analyticky přehled českých plstic vodních" in Klubu prirodov. Praze 1890 (1891), fig. 6 (on p. 30).

Distributed from Hastings to Braemar and Norfolk to Ireland. It is not uncommon in the south of Surrey.

2. *M. SCHOLTZII*, Scholtz.

This is the *S. meridionalis*, Costa, 1860, of Puton's 'Catalogue'; it was also fully described the same year—whether

* Greek *mikros*, small; *nektes*, a swimmer. See 'Entomologist,' 1897, 260.

† "Notes on *Corixa*" in Ent. Mo. Mag. x. 80 (1873).

‡ Proc. Ent. Soc. Lond. 1871, p. iv.

earlier or later I do not know—by Fieber as *S. scholtzi*, and mentioned by Scholtz in 1847,* who says that it is larger than *minutissima*, and has different habits, i.e. it lives in still water with muddy bottom [*minutissima* does live here, though!], not in clear river water. He further mentions that he has not heard a perceptibly audible chirp like *minutissima* utters.†

I have never seen this alive, but Saunders states that it occurs from Lincoln to Sussex, from Somerset to Norfolk.

(To be continued.)

NOTES AND OBSERVATIONS.

THE HABITS OF ASILIDÆ. — There are certain insects, such as the Meloid beetles of the genus *Cantharis*, and the Pentatomid bugs, which appear to be generally protected from enemies by their disagreeable odour or taste. I was interested to observe, when at Pecos, New Mexico, that this protection apparently did not extend to the robber flies or Asilidæ. At Pecos I found a specimen of *Ospricerus abdominalis*, Say, preying on *Cantharis biguttatus*; and in the Pecos Canyon (at 7300 ft. alt.) I found *Stenopogon inquinatus*, Loew, preying on adult *Thyanta perditor*. In both cases I am indebted to Mr. Coquillett for the names of the flies, and it may be added that both are new to the fauna of New Mexico.—T. D. A. COCKERELL.

THE NAME ALDRICHIA. — With reference to the Culicid *Aldrichia* error (cf. p. 142), it may be noted that the name *Aldrichia* is a homonym, having been previously used twice—by Coquillett in 1894, and by Vaughan in 1900.—T. D. A. COCKERELL.

COLLECTING DIPTERA AT LIGHT. — Being in the City of Washington on the night of June 10th, I opened my window wide, hoping to get some moths which might be of service to the British Museum. For some unexplained reason, not a single moth appeared, but, instead, a great number of small flies, all Chironomidæ. I collected a series, and they have been very kindly identified by Mr. Coquillett. He tells me that they are all common; but little seems to be known of the distribution of these minute things, as will be seen by the published records, quoted from Aldrich's 'Catalogue of North American Diptera,' which has just been published:—(1) *Chironomus modestus*, Say. Pennsylvania, New Jersey, New Hampshire, Montreal, Canada. (2) *Tanytarsus tenuis*, Meigen. Europe, Greenland. (3) *Tanytarsus* sp. (4) *Tanypus bellus*, Loew. District of Columbia. (5) *Tanypus choreus*, Meigen. Europe, "North America." (6) *Tanypus monilis*, L. Europe, Pennsylvania,

* "Prodromus zu einer Rhynch.-Fauna von Schlesien pt. 1" in Uebers. Arb. Schles. Ges. Vaterl. Kultur, 1846, p. 106 (p. 2, sep. copy, usually quoted).

† "ob unsere art, gleichwie *S. minuta*, eindeutig wahrnehmbares Schwirren hören lasse, nahm ich bisher noch nicht wahr." I have only recently refreshed myself with this reference, which has been ignored in the papers devoted to hemipterous stridulation.

Wisconsin, New Jersey, New Hampshire. No doubt this list of six species could be much increased by a little more collecting. With one exception, all the species are boreal, which I should not have expected so far south as Washington.—T. D. A. COCKERELL.

MIGRATION OF LEPIDOPTERA. — The interesting note of your correspondent Mr. J. P. Barrett in the current number of the 'Entomologist,' referring to a possible migration of *Euchelia jacobææ*, induces me to place on record an observation which I should not otherwise have considered very remarkable. About 11 p.m. on May 31st I saw several specimens of this species (*E. jacobææ*) settled on and flying round the incandescent gas lamps near here. Two of these were captured, and proved—somewhat to my surprise, considering the date—to be a good deal rubbed. During a residence of seven years I had not noticed this species in the neighbourhood previously; there is, moreover, no ragwort near where they were taken. Is it possible that my specimens formed part of a migratory flight from the Continent, which also reached Margate? In this connection I may add that in September, 1903, when *V. cardui* was extremely plentiful in Essex, while sailing off the Essex coast I saw several specimens out at sea, an easterly wind prevailing at the time. It would be interesting to know the direction of the wind off the south-east coast on the date mentioned above; but I have not the information at hand, and made no note of it at the time. — W. S. GILLES; The Cottage, Bocking, near Braintree, Essex, Aug. 9th, 1905.

NOTES ON LARVÆ OF NYSSIA LAPPONARIA AND ORGYIA ANTIQUA. — I exhibited at the meeting of the South London Entomological and Natural History Society on about June 23rd three larvæ of *Nyssia lapponaria*; they were chosen on account of their fine size, the largest specimen attaining a growth of $2\frac{1}{4}$ in. before going down. These were from a large batch of ova from a wild Rannoch female, and were sleeved on birch almost from the egg. Six or seven of the larvæ grew more rapidly than their fellows, so I removed the smaller specimens to another sleeve, and opened the bottom of the sleeve containing the large ones to a receptacle holding about eighteen inches of light earth, into which they descended in the course of a day or two. One of the rest of the brood that had been removed, having suddenly attained a length of about 2 in., was placed back in the sleeve over earth, and soon went down, the remainder of the brood being then about $1\frac{1}{2}$ in. in length, some rather under this measurement. Imagine my surprise on examining the sleeve three days later to find that one larva had pupated on the gauze, and four others were lying at the bottom shortened and shrivelled, apparently perishing for want of earth in which to go down. I at once changed them into the sleeve containing earth, and several went down at once, none of which exceeded $1\frac{1}{2}$ in. in length. Surely this disparity in the size of the full-fed larvæ of this species is very strange! Perhaps some of our Scottish collectors can give us further information on this interesting subject. Last season the willow tree that I usually reserve for nearly full-fed larvæ of *Smerinthus ocellatus* seemed to be the chosen favourite of every willow-feeding gall-fly in Clapham, for by the middle of July I think I can safely say every leaf had a gall on it, and on some leaves

I counted six and seven. These galls soon became the homes—if I may be allowed the expression—of a number of larvæ of *O. antiqua*; these ate out the interiors of the galls, and then ensconced themselves in the space thus provided. As they increased in size their habitations became too small for them; but this difficulty was overcome by eating a hole opposite that by which they entered the gall, and they then rested with the head projecting from one side of the gall, and the last segments and anal tuft from the other. They presented a most curious appearance when in this position, reminding me irresistibly of a tortoise. B. STONELL; 25, Studley Road, S.W., July 9th, 1905.

ABUNDANCE OF *PIERIS BRASSICÆ* IN WEST MEATH. — I should like to call the attention of practical naturalists to the swarms of *Pieris brassica* which are at present hovering over the cabbage-plots and fields in West Meath, and laying millions of eggs, the caterpillars from which, the moment they are hatched, begin devouring the young plants. In our own case, after paying fifteen shillings for the cabbage-plants, we do not expect to save even a portion of the crop. This is bad enough, but it is far worse for the poor people who have planted their little gardens and lost all their cabbages. Handpicking seems to be the only effectual remedy, and day-labourers cannot spare time for that. Lime, washing soda, &c., and many other remedies have been tried in vain; and now the caterpillars are swarming up the walls of the houses to form chrysalids, and doubly devastate next season, unless some real remedy can be suggested. Where can the clouds of butterflies have come from, as of late years *brassica* has been rather scarce, and what is to be done?—FRANCIS J. BATTERSBY; Cromlyn, Rathowen, West Meath.

WE understand that Mr. G. O. Day, of Knutsford, who is no doubt known to many of our readers, is going abroad to reside in Vancouver Island, B.C., and has placed his valuable and extensive collection of British Lepidoptera in the hands of Mr. Stevens for sale by auction shortly. Mr. Day has been an occasional contributor of articles to this magazine, and, although he is leaving England, we trust that his interest in the pursuit of entomology will be continued, and that he may find in the new country something noteworthy for these pages.

CAPTURES AND FIELD REPORTS.

CYMATOPHORA OCULARIS AND AGROTIS RAVIDA AT HITCHIN. — Thinking it may be of interest, I am writing to report the capture here at sugar of *C. ocularis* (*octogesima*) on the following dates, viz. June 20th, 21st, and 28th; July 2nd, 11th, and 28th. I have also been taking *A. ravida* at sugar.—H. R. GRELLET; Orford Lodge, Bancroft, Hitchin, Aug. 1st, 1905.

PLUSIA BRACTEA IN SELKIRK.—On July 12th, as a friend of mine and I were netting *P. chrysitis*, which were swarming over some tall plants of *Stachys palustris*, he caught a fine specimen of *P. bractea*, which I recognized while bottling. *P. iota* and *P. pulchrina* were very common at the time, and also in a less degree *Abrostola urticae*.—B. WEDDELL.

LEPIDOPTERA CAPTURED AT CLAPHAM. — I have much pleasure in adding three species to my list published *ante*, p. 66. On June 3rd I took a specimen of *Bapta temerata* at rest on a shop window in the Clapham Road, and on June 29th a specimen of *Larentia pectinitaria* in practically the same spot; but I think the most interesting addition is *Abraxas ulmata*. A specimen of this species, in poor condition, was given me alive by Mr. Broomfield, enclosed in a cardboard box with a few specimens of other species. He captured the specimen on July 7th on the window of his shop at 266, Clapham Road, and, not knowing it to be something uncommon, took no special care of it. I should like to add I have never reared *A. ulmata*, and, so far as my knowledge extends, there is no other collector residing in the neighbourhood from whom it might have escaped.—B. STONELL; 25, Studley Road, Clapham, S.W., July 9th, 1905.

PHTHEOCHROA RUGOSANA IN SURREY. — This insect used to occur on Wimbledon Common. I find that I took it in that locality on July 4th, 1876, and again on May 15th, 1878. — F. G. WHITTLE; 7, Marine Avenue, Southend, Aug. 5th, 1905.

PHTHEOCHROA RUGOSANA IN SURREY. — I have taken *P. rugosana* at Nunhead some years ago, but this year I obtained the species in Coombe Warren.—PERCY RICHARDS; "Wellesley," Queen's Road, Kingston Hill.

PHTHEOCHROA RUGOSANA IN SURREY. — I note in this month's 'Entomologist' that *P. rugosana* seems to be regarded as a rarity in this county. Certainly one seldom finds the imago, although it may be found at rest in the hedgerows where bryony is common (the female plant), and sometimes on the wing at dusk; and on two occasions I have taken worn specimens in the kitchen here, attracted by light. During August is the time to get the very much more often found larva; I usually have a look for it during the first week of the month. Find a field hedge where the female (*i. e.* the berried) plant is growing, and pull out the long trailers well laden with berries; if the larva is there, it will generally be found in the little bunches of spun-together berries, or sometimes between the stem and a leaf drawn over it. They are not difficult to breed if kept in the open in a flower-pot half full of mould, and a few pieces of bark on the top; but they are often very restless, and spin a lot of useless web round the rim of the pot. They sometimes spin up on the sides of the pot, sometimes on the book-muslin cover, and sometimes amongst the bark, and nearly always come out most disappointingly small. — A. THURNALL; "Mas-cotte," Whitehall Road, Thornton Heath, Aug. 2nd, 1905.

PHTHEOCHROA RUGOSANA IN SURREY.—Referring to Mr. South's note (*ante*, p. 214), I would like to say that I find from my note-books that during the month of June, 1887, I netted six specimens of *P. rugosana* in a field at Sanderstead; and in the month of June, 1888, I netted seven examples of the species in the same field. — W. D. CANSDALE; Sunny Bank, South Norwood, S.E., Aug. 17th, 1905.

NOTES FROM CORNWALL.—I should like to record a curious variety of *Eupithecia rectangulata*, which I took in North Cornwall this year. The

ground colour of all the wings is white, the basal half of fore wings blotched with light green, and of the hind wings with grey. The specimen was quite fresh, and looks as if it had been bleached. Most of the *E. rectangulata* in the same locality have a lovely pink tinge, but it is very fugitive. We noted a remarkable abundance of *Acidalia subsericeata* in the finest condition. One could hardly move a step without stirring up a specimen or two. *Lycæna arion*, at least in the early part of its season, was distinctly less plentiful than in former years. Is it not time that this insect should be placed on the protected list? In 1903 I know that something like a thousand specimens were taken away from the district, and I should imagine that not many butterflies could stand much of that kind of thing. *E. jasionæata* occurred rather sparingly, but perhaps was not fully out. *Agrotis lucerneæ* was taken flying, and the form is a very dark one, considerably darker than some I have from Aberdeen. All common insects seemed to be very abundant.—W. CLAXTON; Navestock, Romford.

DICHRORAMPHA FLAVIDORSANA, Knaggs = *D. QUESTIONANA*, Zeller, at FOLKESTONE.—On the evening of July 28th, whilst being wheeled round my garden, I noticed a number of little Tortrices flying over a clump of tansy, and, on securing some of them, identified them as my *D. flavidorsana*, a decision in which Mr. Purdey subsequently agreed. I believe that this once overlooked insect will prove to be an abundant species, and also probably widely distributed. — H. G. KNAGGS; Folkestone.

OBITUARY.

It is with much regret that I announce the death, in his ninetieth year, of my venerable and valued friend Mr. W. JOHNSON, who passed away on August 6th at his residence at Wigan. About fifty or sixty years ago there existed in Lancashire and Cheshire a well-known and enthusiastic band of entomologists, amongst whom were W. Johnson, N. Cook, B. Cook, L. S. Gregson, N. Greening, J. B. Hodgkinson, &c. Mr. Johnson was one of the eleven who met at my house on February 24th, 1877, when the Lancashire and Cheshire Entomological Society was founded. He always took a deep interest in the Society, and was a regular attendant at the meetings, and on his removal to Wigan in 1889 he was honoured by being appointed an honorary member. Mr. Johnson was thorough in anything he undertook. I believe he was for thirty years in the engineering department of the Mersey Docks and Harbour Board, from whom he was in receipt of a pension up to the time of his death. Mr. Johnson leaves behind him a collection of Lepidoptera, which is now for sale. Amongst a number of interesting specimens is one of *Fromene ocellæa*, which is one of the three recorded by Mr. Barrett as captured near Liverpool, and I believe was taken by himself.

SAMUEL JAMES CAPPER.

Huyton Park : August 25th, 1905.

THE ENTOMOLOGIST

VOL. XXXVIII.]

OCTOBER, 1905.

[No. 509.

LYCÆNA ORBITULUS, PRUN., *L.* VAR. *OBERTHURI*,
STGR., AND *L. PYRENAICA*, B.

By H. ROWLAND-BROWN, M.A., F.E.S.



1. *L. orbitulus*, ♂. 3. *L. pyrenaica*, ♂. 5. *L.* var. *oberthuri*, ♂.
2. „ under side. 4. „ under side. 6. „ „ under side.

Of the examples figured, 1 and 2 are from Bérissal; 3 and 4 from Gavarnie; 5 and 6 from Caunterets. Both species are subject to considerable variation, but I have endeavoured to bring out the main points of difference as they present themselves in the specimens included in my cabinet series.

L. orbitulus, Prun., of the Alps and Eastern Pyrenees.

♂. Upper wings almost wholly suffused, or sprinkled with hyacinthine blue on a light cinnamon-brown ground. Marginal border broadish and brown-black. Discoidal spot whitish *ocellated*. Lower wings: same coloration; peacock eyes on hind margin discernible on

most of my specimens more or less strongly—generally more. Under side upper wings: yellowish grey. Unbroken line of ocellated anti-marginal spots and marginal spots \rhd -shaped, faint and ill-defined; two discoidal spots, black ocellated white. Under side lower wings: very variable, darker brownish grey to dark brown; two costal spots black, ocellated white. Outer margin yellowish-ochre peacock eyes, and interiorally white spots ocellated black. Broad white fringes all the wings.

L. orbitulus var. *oberthuri*, Stgr.

Described in Staudinger's Catalogue "major," but I have specimens from the Swiss Alps equal in size to those taken by me at Gavarnie and the Lac de Gaube, as figured. Superficially an entirely different insect to *pyrenaica*, with which it sometimes flies, e.g., at Gavarnie.

♂. Ground colour of all the wings upper, and under side deeper; and blackish rather than brown. The discoidal spot on the upper side of the hind wings very much more definite than in the type, which does not occur, according to M. Rondou, in the Central and Western Pyrenees. Under side: in most of my specimens the costal spot on the lower wings is not ocellated, thus suggesting a connecting-link with *pyrenaica*.

L. pyrenaica, B.

♂. Upper wings uniform slaty-blue with faint brownish shading at outer margins. Marginal border sharply defined, and dead black. Discoidal spot dead black, and *not ocellated*. Lower wings: same coloration. Hardly any trace of peacock eyes; in most of my specimens, none. Under side upper wings: faint dove-grey coloured; series of antimarginal spots, more curved outwardly than in *orbitulus*, and wanting in some examples between the nervures occupied interiorally by the discoidal spots. Marginal spots round. The second in the outer margin duplicated, thus . . but ? constant. Under side lower wings: colour yellowish grey. Trace of very slender black marginal border at anal angle only. One costal spot white *without ocellation*. Antimarginal spots blotched, and also unocellated. Two or three bright orange-yellow spots on hindmarginal triangular white blotches. Broad white fringes all wings.

M. Oberthur, in his 'Études,'—which are unfortunately inaccessible to most collectors, there being no copy at present in the library of the Entomological Society,—differentiates *L. pyrenaica*, ♀, as follows:—"Pyrenaica, ♀, est toujours en dessus d'un gris blanchâtre uni et satiné avec une série submarginale d'éclairs intranervarales, et un liséré noir marginal très fin, tandis qu' Orbitulus a le fond des ailes entièrement noirâtre avec le disc saupoudré d'un semis serrés d'atomes bleu argenté. De plus dans les deux sexes la série transversale de points noir intranervariaux aux ailes supérieures est toujours moins droite dans *pyrenaica* que dans *orbitulus*."

A BUTTERFLY HUNT IN THE PYRENEES.

By H. ROWLAND-BROWN, M.A., F.E.S.

THE Pyrenees have received from collectors of Palæarctic Rhopalocera but scant attention of late years as compared with the Alps of Central Europe. The fact is the more remarkable, because the range is quite as accessible as the remoter regions of Switzerland and the Tyrol, while many years' experience of the latter as a touring entomologist leaves no doubt in my mind that for convenience and accommodation the advantage is all with the Pyrenees. A month in July and the early days of August, commencing at Le Vernet in the east and terminating at Biarritz in the west, has left a wholly satisfactory impression of comfortable hotels, clean and well found beyond anything that can be procured at the price in the Alps, though there is of course this disadvantage, that they are situated for the most part on the lower levels; not dotted about among the higher elevations within easy reach of alpine fauna. With the exception of the town of Andorra, which is not French and indescribably primitive and dirty, I can recall no single halting place where the kitchen and *ménage* generally were not sufficient and for the most part admirable. Then, again, it is a pleasure, after collecting in less favoured mountain places in the Cévennes and parts of Southern Austria, to come upon localities where species are represented not "in single spies, but in battalions." The uplands, in fact, as well as the fertile valleys, simply teem with insect-life in summer, and I found this the case wherever I went during the little expedition which I propose to describe.

Unlike the greater part of France, the departments included in the Pyrenean region have been well worked by French entomologists. M. Ch. Oberthur, in his '*Études*,' has figured and described numerous local forms of butterflies and moths found by him during many years' systematic and local collecting; while M. Rondou—"instituteur-naturaliste" and schoolmaster of Gédre in the central area—has collected and reprinted from his series of records, published in the '*Transactions*' of the Linnean Society of Bordeaux, a full and accurate catalogue of the Macro-Lepidoptera, which I found invaluable as a guide wherever I went. Then Mr. H. C. Elwes, in the '*Transactions*' of the Entomological Society of London, published a comprehensive list of the butterflies in 1887; but I do not find in our magazines any detailed notices of recent date, and hope therefore that my own experiences may prove useful, and induce others to follow in my footsteps.

Arriving on July 9th at the Hotel du Parc, Le Vernet, after a not unpleasant journey *via* Toulouse and Perpignan, collecting

commenced the following day. Driving up from Villefranche-le-Confluent, the nearest station, I noticed a specimen of *Satyrus briseis* by the roadside, but did not come across the species again. For I had no opportunity of revisiting the hot enclosed valley in which this and other typically southern or Mediterranean insects are known to occur, such as *Epinephele ida*, *E. pasiphaë*, and *Satyrus fidia*. My rambles, indeed, were generally directed up the valley of the Vernet stream, not only because the ground appeared to promise the best results, but to avoid in the cooler hills the great noontide heat. The opening of the campaign, however, was scarcely propitious, for, having taken the only wrong road possible, I endeavoured to make a short cut across the torrent, and while doing so dropped my net into a boiling whirlpool, and lost it altogether. However, I was well supplied, and, having repaired losses at the hotel, set out under a cloudless sky up the narrow road which leads from Le Vernet to Casteil and the Col du Cheval Mort. *Melanargia lachesis* swarmed everywhere, but very few females appeared to have emerged at this date; nor did I find them at all common at any time during the week, while the form predominant was more heavily marked than specimens I have seen from Pont du Gard, and would, I assume, be the var. *canigulensis* of Oberthur; nor was it unusual to meet with the aberration in which the ground colour of the wings is faint yellow in place of the normal pearly white.

Among the Spanish chestnuts and upon the ash trees, which are quite a feature in the riverside meadows, males of *Læsipis roboris* were disporting themselves in the sunshine, but they were already on the wane; and Mr. A. H. Jones, who preceded me by about a fortnight at Le Vernet, tells me he found them in perfect condition then; so that M. Rondou's note for "June and the beginning of July" is no doubt more accurate than Kane's "May-June-July" inclusive; while it is now established that the food-plant of the larva is ash and not oak, as stated in 'European Butterflies.' Of the Theclids, *T. ilicis* was as usual common upon the sedum flowers, but I did not notice any examples of *ab. cerri*. I also took a couple of females of *T. acaciæ* close to Casteil, but they were more or less *passées*. Near the same place I also netted and released a single female *Thais* var. *medesicaste*, the date—July 10th—being the latest I have ever encountered this charming insect. Among a herd of commoner things also, an occasional *Melitæa deione* was still upon the wing, though *M. dictynna* var. *vernetensis*, Oberth., described as "a constant race differing from the type," and much less obscurely coloured, was evidently over. Upon the trailing clematis *Argynnis daphne* disputed the place of honour with *A. paphia*, and here also *Cyaniris argiolus* was to be seen in numbers, while the dusty mule-path was alive with *Satyrus alcyone*, rather more definitely marked than the alpine form, and with the yellowish stain more pronounced. Every patch

of moisture, too, was crowded with thirsty butterflies, *Papilio podalirius* and the commoner Hesperids being perhaps the most persistent. However, the Lycænids usual to such places were rather sparsely represented, though I picked up individual fine specimens of *Lampides bœticus*, *Lycæna argiades*, *L. hylas*, and *L. amandus*, among the less common, but all males; flying with them were also *Carcharodus althææ*, *Hesperia alveus*, and *H. sao*. But far and away the commonest butterfly on the wing was *Erebia stygne*, which evidently follows immediately on the heels of *E. evias*, of which I only observed a few worn females; nor did I meet with the var. *pyrenaica*, Rühl., at these levels. But for size and brilliancy of colouring these typical *stygne* exceed any I have ever taken; the females being especially fine, and the ocellations of the upper side of the wings large and numerous.

On July 13th I made the ascent of the Canigou, the imposing isolated rock which surveys the Mediterranean from Barcelona to Montpellier, going by way of the Col du Cheval Mort, by far the easiest and most agreeable route in my opinion, as it abounds in streams and springs, in striking contrast to the road by Fillols and the Col des Cortalets, which is for the greater part shadeless and arid. The day promised for the best when I left Le Vernet at 5 a.m., and continued fine until I was within half an hour of the top six hours later. At that time, however, a gale of wind had sprung up, and, though no rain fell, mist and cloud gathered upon the mountains, and were not dispelled until late in the afternoon. The circumstance was all the more disappointing, as I had hoped for at least three hours' collecting on the rocks where the higher *Erebias* are recorded. However, I did disturb a few fine specimens of typical *E. lappona*, close to the summit (9135 ft.), and, after fighting against a furious wind for about an hour on the way to the chalet hotel of Les Cortalets, I came to a sheltered stony waste just above the tree-line, where males of *Erebia melas* var. *pyrenæa*, Oberth., were flying singly, and very difficult to catch. The one specimen netted I associate with this variety; it is smaller than the forms of *E. lefebvrei* taken by me elsewhere, and there is no trace of the normal ocellations on the upper side of the hind wings. But Mr. Elwes (Trans. Ent. Soc. 1898), in his "Revision of the Genus *Erebia*," has proved conclusively that *Erebia melas*, Hbst., does not occur in the Pyrenees, and Dr. Chapman has also determined that, organically, *Erebia lefebvrei* is a good species, with which therefore the vars. *pyrenæa*, Oberth., and *intermedia*, Oberth., should be associated, and not, as in M. Rondou's list, with *melas*. The only other typically alpine butterfly I encountered on this occasion was *Argynnis pales*, flying over the alpine rose, now in full bloom, as was the dwarf broom—a combination of colour at once gorgeous and effective. Lower down on the route above Casteil, where I did most of my collecting, *Euchloë euphenoides* was not uncommon,

the females in fine condition, and showing some considerable variation from those caught by me on the Mediterranean littoral and at Digne. In my Vernet specimens the flush at the apex of the fore wings only shows obscurely and subordinate to the heavy black markings, whereas in all my lowland females the colour scheme is exactly reversed. Again, the contour of the wings appears to me to be rounder than is the case with specimens from Vésubie, Cannes, and Digne, and to approximate more closely in shape to that of *E. eupheno* from Algeria. Lastly, the suffusion of the lower wings is rather primrose than orange, and the black markings generally, as well as the discoidal spot, are more definite and pronounced.

A visit to the Valley of St. Martin close by concluded my excursions at Le Vernet, but I did not come across *Libythea celtis*, which Struve reports as "not rare," though I am almost certain I put up a specimen of this interesting butterfly on the road to Casteil aforesaid. The valley and its approaches, however, afforded excellent sport, *Parnassius apollo* and *Chrysophanus virgaureæ*, with *Satyrus circe*, *Gonepteryx cleopatra*, and again *Lætopis roboris* being abundant everywhere.

From July 17th to July 22nd I added nothing to my bag, being engaged on an expedition to Andorra, though I should certainly have waited a day or two to explore the mountains about Montlouis (5280 ft.) had distances been less great and the weather more settled. With the last of the road from Villefranche to this place the southern character of the fauna changes, nor did I notice any butterflies other than of the commoner species on the ten hours' march through the tiny Republic, locked in the heart of the mountains, where the pastures were gay with the great purple Spanish iris, which is such a feature of the Pyrenees when once across the Mediterranean watershed. I was, however, already on the look-out for *Lycæna pyrenaica*, but the "blues" I saw on the Col de Puymorens were typical *orbitulus*, and, as far as I could observe from superficial examination on the wing, in nowise different from the *orbitulus* of the Alps. By the 21st—one of the hottest days I can remember, and spent for the most part in a slow stuffy train—I had changed my venue from the eastern to the central Pyrenees, and the next day, after a pleasant drive from Luz, cooled by a sharp and welcome thunderstorm, arrived at Gavarnie, where I remained until the 29th.

The marked difference between the eastern and the central and western slopes of the Pyrenees cannot fail to impress those who make the journey of the chain from end to end. Le Vernet and the lower valleys around Perpignan are more or less Mediterranean and meridional in the matter of flora and fauna. The almond shares with the vine the fruitful red soil; the parched uplands are fragrant as gardens with the scented lavender and odorous herbs common to these regions. Crossing from Roussillon

into the Cerdagne, and descending into Béarn, the whole character of the country is transformed. The fields are thick with corn and maize; the copses composed of beeches, hazel, and other woodland trees familiar to English eyes; while patches of purple heather replace the cistus and the lavender upon the lower hills.

Gavarnie itself stands at quite a respectable altitude (5085 ft.), but the best collecting ground is at least a thousand feet higher on either side of the famous "Cirque," to the eastward in the Vallée d'Estaubé, to the west in the Vallée de Poueyespée. About two hours' walk up steep grassy slopes, on the morning of the 23rd, brought me to the best part of first-named locality, and I made a second expedition thither on the 25th. The day was eventful, for I took for the first time three butterflies not hitherto met with by me anywhere else, and the three which belong exclusively to the Pyrenees—*Erebia lefebvrei* (type), *E. gorgone*, and *Lycæna pyrenaica*. The former I found here, as elsewhere, on the stony "shoots" of loose stones which lie just under the snow patches at an elevation of perhaps 7500 ft., and I found the chase as difficult, as tiring, and as elusive as of that *Erebia glacialis* var. *nicholli* of Campiglio which the males so closely resemble as to have deceived the most experienced entomologists into considering the two identical. Superficially no doubt the resemblance is near enough; but the females—which, unlike *glacialis*, were at least as frequent as the males—exhibit a very marked contrast both to those of var. *nicholli* or of var. *alecto*. My series from this valley and from the Poueyespée—where it was much commoner and came lower down, but was distinctly smaller and brighter—is composed of strongly coloured specimens, with the ocellations well marked on a bright band of reddish chestnut. M. Oberthur has made this form the type, but the richness of pigmentation and the number of eye-spots is extremely variable, and I can by no means determine from the thirty or forty odd specimens captured at Gavarnie where his var. *intermedia* is intended to begin and where to end. Meanwhile, it is perhaps worth noting that whereas *E. lefebvrei* was taken only flying or settling on the stones, where *E. gorge* was also not uncommon, the closely allied *E. gorgone* was wholly confined to the grassy hillocks and slopes, where it occurred in profusion; and above the Lac de Gaube at Cauterets, where I met with it again, it exhibited the same peculiarity. Some of the males certainly bear an extraordinary resemblance to those of *gorge* on the under side, but there is no mistaking the females with the pronounced white venation. *Gorge* is here also a much finer insect than the familiar types of the Alps, though M. Rondou avers that farther east it approximates closely to the form taken on the Riffelberg. The ab. *erinnys*, Esp., in which the apical eyes are obsolete, or nearly so, and the var. *triopes*, Spr., however, have not been reported so far. And it is also noteworthy

that while all specimens seen or taken of *E. tyndarus* appertain to var. *dromus*, H.-S., examples of *E. lappona* correspond invariably to Graslin's bandless ab. *sthenno*, the type apparently not occurring west of the Canigou region. I was not fortunate enough to take more than a half-dozen *L. pyrenaica* at Gavarnie, and they were all males, the brood evidently being hardly yet emerged; but they are enough to illustrate the marked differences of shape and coloration as between it and the closely allied *orbitulus*. *L. pyrenaica*, again, which has a special taste for animal droppings, is by no means confined to the heights, for among the many butterflies collected together on a muddy piece of the way to the Cirque just outside Gavarnie, I could one day have taken several had not an intrusive mule splashed into the middle of the covey! *Carcharodus lavateræ* also swarmed at the same place, and I had no less than half a dozen in my net at the same moment, though I found scarcely one of them to be in cabinet condition, and pill-boxing this species generally ends in the prisoner dashing itself to pieces.

An excursion to the Vallée d'Héas was, entomologically speaking, a failure, redeemed, however, by the spectacle of countless flights of *Parnassius apollo*; nor did the long weary tramp back to Gavarnie over mountain pastures burnt brown afford a compensation. But the Vallée de Poueyespée was productive enough to encourage a second visit, and here I met *Colias phicomone*, *E. var. cassiope*, nice well-marked examples which may be referred to var. *pyrenaica*, H.-S., and some more fine females of *E. lefevrei*, the best, however, being confined to a sort of rocky amphitheatre high up on the right bank of the Gave des Tourettes, where a snow-fed torrent descends from Les Sarradets. Slightly lower down occurred also *M. parthenie* var. *varia*, with occasional *A. pales*, and a very distinctive form of *E. tyndarus* var. *dromus*.

I left Gavarnie and the comfortable Hotel des Voyageurs with regret, but already the sands of holiday time were running out, and I wished for a glimpse at least of Caunterets before turning my homeward footsteps towards Biarritz. The most interesting route from Gavarnie lies across the mountains by the Route du Vignemale; but a multiplicity of baggage, a camera, and my entomological apparatus precluded the dispatch of fragile impedimenta round by Pierrefitte, so I took the road and the electric railway in the ordinary way. A single fine day, however, at the Lac de Gaube was destined to be the finale of my mountain experiences, and I climbed thither with the more eagerness, inasmuch as M. Rondou had informed me of the discovery there a few days previous by M. Oberthur of *L. zephyrus* var. *lycidas*, a *Lycænid* hitherto not known to inhabit the Pyrenees. But, though I hunted diligently over the ground for three hours, I am unable to confirm this interesting news personally, and I conclude that

I did not go high enough above the torrents which feed the lovely lake, and beside which *lycidas* had been observed and captured. But I turned up some interesting species all the same—*Pieris callidice*, larger and more vividly marked with green on the under side than Stelvio and Swiss specimens in my collection; *L. eros*; and some fine *M. dictynna*, darker and more intensely banded than any yet encountered. Unfortunately the next two days were wet, and on August 1st I was due in Biarritz.

(To be continued.)

A NEW GENUS OF HEMITELINI (ICHNEUMONIDÆ) FROM CAPE COLONY.

BY P. CAMERON.

I HAVE had for some time under observation an ichneumon whose systematic position was not at all clear to me. The recent examination of some fresh material has enabled me to refer it to a new genus of *Hemitelini*, allied to *Lienella*, Cam. It is readily known from all Ichneumonidæ by there being only three abdominal segments, and by the last being stoutly spined laterally. The form of the abdomen reminds one of the Braconid genus *Spinaria*. The *Hemitelini* without an areolet (as in the present genus and in *Lienella*) appear to be well represented in Cape Colony.

Acanthoprymnus, gen. nov.

Abdomen with three segments of equal size, the apex of the last transverse, the sides ending in a sharp spine; the first segment broad at the base, half the width of the apex; there are two stout keels down the centre. Wings without an areolet; the recurrent nervure is received distinctly beyond the transverse cubital; the transverse median received shortly beyond the transverse basal. Transverse basal nervure in hind wings broken distinctly below the middle. Median segment short, areolated, the areola large, 6-angled, obliquely narrowed towards the base, the apex transverse; there are two large areæ on either side of it; the apex is bordered by a stout keel. The whole segment is stoutly striated; its spiracles are small, oval—its base is deeply depressed. Scutellum keeled at the base. Parapsidal and pleural furrows deep. There is a distinct malar space. Hinder ocelli separated from the eyes by about the same distance as they are from each other. Occiput margined. The clypeus is not separated from the face; there is a distinct fovea on either side of it; its apex transverse. Mandibles with a minute subapical tooth. There is a broad curved transverse furrow on the middle of the second, and a narrower one on the third. Wings uniformly fuscous. Discoidal cellule closed at apex. The antennæ unfortunately are broken off.

Acanthoprymnus violaceipennis, sp. nov.

Black; the pro- and mesothorax red; the apex of the last abdominal segment and the spines white; the four front legs, except at the base, rufo-testaceous; the hinder black, with the basal fifth white. Antennal scape dark rufous, as are also the mandibles; the palpi dark testaceous. ♀. Length, 7 mm.

Face and clypeus closely rugose, intermixed with striæ; the vertex and upper part of front much more coarsely rugosely punctured; the lower part of the depressed front closely, strongly, transversely striated. Temples wide, obliquely narrowed. Mesonotum transversely, irregularly, rugosely striated; the sides punctured. Scutellar depression deep, wide, with four stout keels; the scutellum deeply, but not very closely, punctured. The basal depression of the metanotum stoutly, closely striated; the areola has a long central and a shorter lateral keel; the others are closely, irregularly reticulated-striated. Pro- and mesopleuræ closely, strongly punctured, more or less striated; the metapleuræ closely, rugosely reticulated. The first abdominal segment between the keels is stoutly striated, the striæ clearly separated; the sides are in two parts, separated by an oblique keel; the apical part is the larger, and is more depressed; both are irregularly, obliquely, widely striated; the other segments are closely, strongly, longitudinally striated; the depression on the second segment is more widely striated; the longitudinal striæ are intersected by finer transverse ones, forming reticulations; the white apex, between the spines, is smooth. The alar nervures and stigma are black; the latter is narrowly white at the base. Tegulæ red. The sides and middle of the mesosternum are black.

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND
VERNET-LES-BAINS.

By R. S. STANDEN, F.L.S., F.E.S.

BARCELONA.

WHAT made us select Tibidabo as the scene of our operations I really don't quite know. At first I think we were captivated by a sort of quaint ring about the name, and we kept on repeating it to ourselves—at least I did—like schoolboys. Then it was the highest ground, with a rough scrubby look about it, within easy reach of the city. There was an electric tram to the very foot of it—about three miles distant—and on the top, as we afterwards discovered, a restaurant of great restorative powers after a two hours' climb in the sweltering heat. We collected for two days (May 30th and 31st) on this hillside on our way to Majorca, and again one day (June 12th) on our return. In these three days we took twenty-seven species of butterflies, which, although comparing unfavourably in point of numbers with three days' collecting in almost any Swiss valley, are interesting in so far that six of them are unknown in Switzerland.

In one respect—*viz.*, in the absence of water and the consequent xerophytic character of the vegetation—this locality had much in common with Majorca, and when we come to compare the species we find that ten out of the thirteen taken in Majorca occurred here also; and doubtless, with a wider search, the three absent species, *G. rhamni*, *G. cleopatra*, and *E. ida*, would also have been observed, which seems to confirm the theory—if any doubt ever existed about it—that the islands were formerly joined to the mainland. The dissolution of the partnership appears to have had a disastrous effect upon the isolated partner as far as Lepidoptera are concerned.

To me it was a great joy to see, for the first time, that lovely little thing *Euchloë euphenoides* on the wing. We were probably late for it, as I only saw two, but those two seemed to lift the parched-up landscape out of the commonplace into (I had almost said) a terrestrial paradise. *Melanargia syllius*, too, was new to me, and new also its method of flight, which generally left me much worsted in the race. But the most interesting capture was *Melitea aurinia* var. *iberica*, a large and beautiful endemic form. The butterflies captured here were as follows:—*Papilio machaon*, L.; one fine specimen. *Pieris rapæ*, L.; several. *P. daplidice*, L.; several. *Euchloë belia*, gen. æstiv. *ansonis*, Hb.; one only. *E. euphenoides*, Stgr.; two males. *Leptidia sinapis*, L.; several. *Colias edusa*, F.; a few. *Pyrameis cardui*, L.; occasional specimens. *Melitea aurinia* var. *iberica*, Obth.; abundant—a large and beautiful purely Spanish form, with a deep orange-red ground colour on both sides, many of them rather worn. *M. phœbe*, Knock; several, very fine. *M. athalia*, Rott.; a few. *Melanargia syllius*, Hbst.; common, but getting worn on our second visit. *Pararge aegeria*, L.; common and fine. *P. megæra*, L.; common and fine. *Epinephele jurtina* var. *hispulla*, Hb.; abundant and fine, replacing the type. *E. pasiphaë*, Esp.; very abundant and fine. *Thecla ilicis*, Esp.; a few. *T. ilicis* var. *æsculi*, Hb.; one or two. *Chrysophanus phleas*, L.; occasionally. *Lampides telicanus*, Lang; one fine female. *Lycana astrarche*, Bgstr.; very common; marginal row of red spots very bright; finer if anything than the Corsican form. *L. icarus*, Rott.; a few. *L. escheri*, Hb.; fairly common. *L. coridon*, Poda; fairly common. *Cyaniris argiolus*, L.; a few. *Adopæa thaumas*, Hufn.; a few. *Thanaos tages*, L.; a few, very fine.

MONTSERRAT.

There was not much to detain us in Barcelona. Having, on our previous visit, exhausted our stock of adjectives over the wonders of the cathedral, with its magnificent cloisters and sacred ducks, over its fine promenades lined with palms and the oriental sycamore, and its bewildering network of trams, Jones and I decided to do a pilgrimage to the monastery of Montserrat.

Nicholson was still staying on for three or four days in Majorca, to tear a few more mosses off the rocks, to try to run to earth some of the talayots, a kind of dolmen for which the south of the island is famous, and to visit the stalactite caves at Manakor. A journey of two hours brought us to the main line station of Montserrat, whence we embarked on a "funiculaire," and crawled up in serpentine fashion to the monastery, taking just an hour to cover the five miles.

The vast agglomeration of buildings was so ensconced in a towering amphitheatre of conglomerate rocks that we only became alive to their existence on arriving at the little station below the church. A uniformed official was there to escort us to the bureau, where the reverend father who presided at the office-desk allotted to us a fairly spacious cell in the block dedicated to Santa T  resa de J  sus. On the ground floor of this block, in a dark arcade, was a series of little shops, where pilgrims who catered for themselves could purchase all necessary comestibles and cooking apparatus, and this was supplemented every morning by a vegetable and fruit market outside. For those to whom, like ourselves, the culinary department was an unfathomable mystery, there was an excellent restaurant at one end of the courtyard. We lost no time in testing its capacities for the midday meal, and then set out with our nets for a ramble up the western slope, which towered up to 4000 ft.—1000 ft. above the monastery itself. The way was arduous and long, but we were always buoyed up with the hope of a possible *Erebia*—if not new to science, at least with characteristics befitting the isolated situation of the vast pile of limestone on which we stood. It was no doubt a futile hope at this comparatively low elevation, and our toil went unrewarded. In a round of about five miles our captures were limited to a few *Lyc  na astrarche*, *L. icarus*, *L. coridon*, *Melitea aurinia* var. *iberica*, and *Pararge megera*.

We got back just in time for vespers at the magnificent Basilica attached to the monastery. In the choir were about thirty boys and twenty monks. The entire service, which lasted rather over the hour, was choral, accompanied by a fine organ, and the music was some of the most wooing and soul-enthraling I ever listened to. It is said that nothing finer can be heard out of Madrid, and we attended the same service on the two following days.

There are only two roads out of Montserrat, one east and the other west, and, as we had already explored the latter, with divergences to right and left, and a minimum of success, we now decided to take the eastward road, which brought us in about four miles to the Convent of St. Cecilia. Collecting here was of a very different character, and, if the number of species was not very great, many of them were very abundant. First and foremost among these were *Melitea aurinia* var. *iberica*, a

very fine form, already mentioned as occurring at Barcelona; then came *Euchloë euphenoides*, very fresh and fine, the males preponderating largely over the females; next, in point of numbers, *Lycæna astrarche*, *L. icarus*, *L. coridon*, *Leptidia sinapis*, *Melitæa athalia*, *Pararge ægeria*, *P. megæra*, *P. mæra*, and *Melanargia syllius*. The road was flanked on our left with huge overhanging pudding-stone rocks, and on the right stretched away a rich warm-coloured panorama of alternating broken ground and cultivated fields, terminating with the limitless horizon of the sea.

So attractive was this route, so soft the air, and so delightful the intervals of shade afforded by the trees which here and there intercepted our view across the plains, that we decided to devote to it our third and last day also. On this occasion we extended our walk for about a couple of miles beyond the convent, and were rewarded with a few solitary examples of *Colias edusa*, *Limenitis camilla*, *Vanessa polychloros*, *Thecla ilicis*, and others.

Near the convent was an excellent little restaurant, where we obtained an omelette, cutlets, bread and cheese, cherries, and delicious peaches brought up that morning from an orchard down below, with a delicious red wine and coffee, for the ridiculous sum of 1s. 6d. apiece. On our way home we were treated to a fine specimen of a mountain thunderstorm, and got fairly drenched, but in a quarter of an hour the sun was out as hot as ever, and we had walked ourselves dry by the time we reached the monastery. The next morning (June 16th) we returned by an early train to Barcelona.

The butterflies taken at Montserrat were as follows:—*Aporia crategi*, L.; a few. *Pieris rapæ*, L.; fairly common near the monastery. *P. daphidice*, L.; one fine male. *Euchloë euphenoides*, Stgr.; male very abundant, female scarce. *Leptidia sinapis*, L.; common. *Colias edusa*, F.; occasionally. *Gonepteryx cleopatra*, L.; not common. *Limenitis camilla*, Schiff.; two or three specimens. *Pyrameis atalanta*, L.; one specimen. *Vanessa polychloros*, L.; one very fine specimen, just emerged, June 14th. *Melitæa aurinia* var. *iberica*, Obth.; the most abundant butterfly on the wing, and for the most part in much better condition than those taken at Barcelona. *M. cinxia*, L.; two specimens, paler than English examples. *M. athalia*, Rott.; fairly common. *Melanargia syllius*, Hbst.; occasional worn specimens. *Pararge ægeria*, L.; fairly common. *P. megæra*, L.; fairly common. *P. mæra*, L., gen. æstiv., Hb.; one only, a very beautiful form, in which the fulvous area of both wings is much larger; apparently a connecting-link with *megæra*. It occurs also at Vernet and in the Cévennes, and replaces the type in both places. *Cœnonympha arcania*, L.; a few. *Lycæna argus*, L.; three or four specimens. *L. icarus*, Rott.; fairly common—one interesting variety. *L. escheri*, Hb.; occasionally. *L. bellargus*, Rott.;

a few. *L. coridon*, Poda; a few. *Adopæa thaumas*, Hufn.; a few. *Hesperia malvæ*, L.; a few. *Thanaos tages*, L.; occasionally.

(To be continued.)

A NOTE ON SOME SPECIES OF *PREPONA*.

PERCY I. LATHY, F.Z.S., F.E.S.

HERR FRUHSTORFER, in the 'Iris,' 1905, pp. 304, 305, places *P. garleppiana*, Stgr., as a subspecies of *P. neoterpe*, Honrath, and places two other species, *P. brooksiana*, Godm., and *P. deiphile*, Godt., between that species and *P. enagoras*, Hew.

This is incorrect, as *enagoras*, Hew., should follow *garleppiana*, Stgr.; on the under side there is very little difference between *neoterpe*, Honrath, and *enagoras*, Hew., and *garleppiana*, Stgr., but these three forms may at once be separated from Godman's and Godart's species by the extremely irregular postmedian line of fore wing below. According to Fruhstorfer's own showing, *deiphile*, Godt., cannot come between *garleppiana*, Stgr., and *enagoras*, Hew., as it possesses yellow tufts, while the latter species have dark brown, almost black tufts, and Fruhstorfer divides the genus into two sections by this character, Sect. B. 1 with black, and Sect. B. 2 with yellow tufts. *Garleppiana*, Stgr., is more like *enagoras*, Hew., than *neoterpe*, Honrath; in fact, the only way it differs from the former is that it has metallic blue bands on both wings above, but it possesses the submarginal orange spots and costal streak, both of which are wanting in *neoterpe*, Honrath.

Fruhstorfer may not know the true *garleppiana*, Stgr., as two or three years ago several specimens of *neoterpe*, Honrath, were sent out by a German dealer as Staudinger's species. If this error was not corrected, it would have caused confusion. As I write I have before me Honrath's type and a co-type of Staudinger's, and I have also seen Staudinger's type at Dresden.

I am inclined to think either that Staudinger was right in supposing *garleppiana* to be an aberration of *enagoras*, Hew., or that it is a hybrid between that and *neoterpe*, Honrath.

Fruhstorfer gives Columbia as the only locality of *P. prænestæ*, Hew. I am able to add New Granada, the original locality; Zamora, Ecuador, one specimen taken in July, 1886, by the Abbé Gaujon; and San Remon, Peru, two specimens taken in July, 1903, by Watkins and Tomlinson, and one by Watkins in 1904.

The specimens from the different localities exhibit slight differences. The Ecuador example has a much narrower red *fascia* on fore wings above, and both Ecuador and Colombian

specimens want whitish spots beyond middle of hind wings below; while those from Peru have the red fascia as wide as in *buckleyana*, Hew., and the spots on under side of hind wings almost as conspicuous as in that form. The blue on the wings above is brighter in the Peruvian specimens. In one *buckleyana*, Hew., are three small red spots near margin above the fascia. There is little doubt that specimens will eventually be procured linking all the forms.

CURRENT NOTES.

By G. W. KIRKALDY.

1. HAECKEL, ERNST: "The Wonders of Life," translated by Jos. McCabe, pp. i-xi and 1-485; Harper, London and New York (Jan. 1905).
2. CARPENTER, G. H.: "Injurious Insects and other Animals observed in Ireland during the year 1903" (Economic Proc. Roy. Dublin Soc. i. pp. 249-66; pls. xxi-xxii; text-figs. 1-7 (July, 1904)).
3. FELT, E. P.: "Mosquitoes or Culicidæ of New York State" (Bull. N. Y. State Mus. [No. 79; Entom. No. 22], pp. 241-400; pls. 1-57; text-figs. 1-113 [Diptera] (1904)).
4. WESCHÉ, W.: "Some New Sense Organs in Diptera" (J. Quekett Micr. Club (2), ix. pp. 91-104; pls. 6 and 7; 6 text-figs. (Nov. 1904)).
5. BREDDIN, G.: "Rhynchoten aus Ameisen- und Termitenbauten" (Ann. Soc. Ent. Belg. xlviii. pp. 407-16; 1 text-fig. (1904) [Hemiptera, Hymen., Neuroptera]).
6. BUENO, J. R. DE LA TORRE: "Notes on *Hydrometra lineata*, Kirk. (= *lineata*, Say)" (Canad. Entom. pp. 12-15; text-figs. 3-4 (Jan. 1905) [Hem.]).
7. ARROW, G. J.: "Sound-production in the Lamellicorn Beetles" (Trans. Ent. Soc. London, pp. 709-50; pl. 36 (Dec. 23rd, 1904) [Coleoptera]).
8. MANDERS, N.: "Some Breeding Experiments on *Catopsilia pyranthe* and Notes on the Migration of Butterflies in Ceylon" (*op. cit.* pp. 701-8; pls. xxxiv-v [Lepidoptera]).
9. GREEN, E. E.: "Notes on Australian Coccidæ," &c., No. 1 (Proc. Linn. Soc. N. S. Wales, xxix. pp. 462-5; pl. xvii. (Dec., 16th, 1904) [Hem.]).
10. GODING, F. W., & FROGGATT, W. W.: "Monograph of the Australian Cicadidæ" (*op. cit.* pp. 561-670; pls. xviii-xix (Dec. 16th, 1904) [Hem.]).
11. GIRAULT, A. A.: "*Anasa tristis*, De G.; History of Confined Adults; Another Egg Parasite" (Ent. News, xv. pp. 335-7 (Dec. 1904) [Hem., Dipt., Hymen.]).

12. MUCKERMANN, H.: "*Formica sanguinea* subsp. *rubicunda*, Em., and *Xenodusa cava*, Lec.; or the Discovery of Pseudogynes in a District of *Xenodusa cava*, Lec." (*op. cit.* pp. 339-41; pl. xx [Hymen., Coleopt.]).
13. HANDLIRSCH, ANTON: "Zur Systematik der Hexapoden" (*Zool. Anzeiger*, xxvii. pp. 733-59 (July 12th, 1904)).

Haeckel's "Wonders of Life" (1) is a supplementary volume to "The Riddle of the Universe," dealing more particularly and fully with certain biological problems and phenomena, and is a work that no thoughtful entomologist can afford to lay aside without study. The book is divided into four sections, viz. Knowledge of Life, Nature of Life, Functions of Life, and History of Life. Apart from a general consideration of certain phenomena, there are many entomological notices, as, *e. g.*, in the chapter on Reproduction. Prof. Carpenter's report (2), the price of which is nominal, should be in the hands of every British entomologist. Some fourteen insects, belonging to five orders of insects and to the Acarina, are treated of in detail. The plates represent photos of *Gortyna ochracea* (Lep.), *Chionaspis salicis* (Hem.), &c.

Felt (3) furnishes a full and detailed account of the mosquitoes of New York State, considered systematically, biologically, and economically; elucidated by three hundred and thirty-one separate figures. Although treating of American species, the work will be indispensable to British students.

Bredin (5) describes a number of Neo-tropical, Oriental, and Sudanese ant- and termite-nest living Hemiptera, including a number of immature forms. Bueno (6) extends the observations of Martin* on the life-history and habits of the North American *Hydrometra martini*, and finds that the more southern var. *australis* of Say is a good species, figuring the male genital segments of both forms.

Green (9) describes an interesting Coccid, *Antonina australis*, from nut-grass (*Cyperus rotundus*). This nut-grass has recently found its way into Honolulu, where it is a terrible nuisance. Green designates it "n. sp."; at least two previous descriptions have, however, appeared in print, the earliest being in Proc. Linn. Soc. N.S.W. xxviii. p. 686 (April 28th, 1904). Goding and Froggatt (10) have monographed the Cicadidæ of the Australian continent. There are one hundred and nineteen species distributed among twenty-one genera; four genera and forty-seven species are described as new. *Melampsalta*, Kolenati, should be replaced by *Cicadetta* of the same author.

Girault (11) observed *Hadronotus carinatifrons*, Ashmead, ovipositing in the eggs of the American Lygalid *Anasa tristis*;

* See 'Entomologist,' xxxiii. pp. 175-6 (June, 1900).

at another time a tachinid fly issued from the abdomen of a female *Anasa* which had previously copulated.

Arrow (7) gives an interesting account of sound-producing organs in Lamellicorn beetles, a large proportion being novel. There is an appendix of two new genera and seven new species, and a list of stridulating Lamellicorn genera.

Manders (8) briefly discusses the migration of butterflies in Ceylon, illustrated by a map (pl. xxxv.).

Handlirsch (13) devotes considerable attention to the systematics of the Hexapoda, in particular with regard to Boerner's peculiar views. Without going deeply into the paper, which would indeed require almost a full translation to do it justice, a reproduction of the orders, &c., adopted will be of interest:—

Class I. Collembola (*Lubbock*).

Order 1. Arthropleona (*Boerner*).
 „ 2. Symphypleona (*Boerner*).

Class II. Campodeoidea, *Handlirsch*.
 (= Archinsecta, *Haeckel*.)

Order 1. Dicellura (*Haliday*).
 „ 2. Rhabdura (*Silvestri*).

Class III. Thysanura (*Latr.*).

Subclass 1. Orthopteroidea, *Handlirsch*.

Order 1. Orthoptera (*Olivier*).
 „ 2. Phasmoidea, *Handlirsch*.
 „ 3. Dermaptera (*De Geer*).
 „ 4. Diploglossata, *Saussure*.
 „ 5. Thysanoptera, *Haliday*.

Subclass 2. Blattæformia, *Handlirsch*.

Order 1. Mantoidea, *Handl.*
 „ 2. Blattoidea, *Handl.*
 „ 3. Isoptera, *Comst.*
 „ 4. Corrodentia (*Burm.*).
 „ 5. Mallophaga (*Nitsch*).
 „ 6. Siphunculata, *Meinert*.

Subclass 3. Hymenopteroidea, *Handl.*

Order 1. Hymenoptera, *Linn.*

Subclass 4. Coleopteroidea, *Handl.*

Order 1. Coleoptera (*L.*).
 „ 2. Strepsiptera, *Kirby*.

Subclass 5. Embioidea, *Handl.*

Order 1. Embiaria, *Handl.*

Subclass 6. Perloidea, *Handl.*

Order 1. Perlaria, *Handl.*

Subclass 7. Libelluloidea, *Handl.*

Order 1. Odonata, *Fabr.*

Subclass 8. Ephemeroidea, *Handl.*

Order 1. Plectoptera, *Pack.*

Subclass 9. Neuropteroidea, *Handl.*

Order 1. Megaloptera (L.).

„ 2. Rhaphidioidea, *Handl.*

„ 3. Neuroptera (*Linn.*).

Subclass 10. Panorpoidea, *Handl.*

Order 1. Panorpatæ, *Brauer.*

„ 2. Phryganoidea, *Handl.* [= || Trichoptera.]

„ 3. Lepidoptera, *L.*

„ 4. Diptera, *L.*

„ 5. Suctoria, *De Geer.*

Subclass 11. Hemipteroidea, *Handl.*

Order 1. Hemiptera (*L.*).

„ 2. Homoptera (*Leach*).

NOTES AND OBSERVATIONS.

PUPATION OF *SMERINTHUS TILIÆ*.—On August 27th, while taking a short stroll in Walmer, I found a *Cossus*-infected elm, in the bark of which were holes through which the moths had made their exit. On removing the bark from one of these holes I, of course, found the cocoon of *ligniperda*, but in it I found a perfect and apparently newly-turned pupa of *tiliæ*. The pupa was very lively, and certainly a fresh one. Surely this is a singular method of pupation for this insect?—R. A. JACKSON; Hollingbourne, September 9th, 1905.

A NEW PEST OF THE ORANGE.—Last May, Professor V. A. Clark sent me a larva which was eating the leaves of orange trees at Phoenix, Arizona, doing some damage. Only the young trees were affected, the old ones going unharmed. I bred the moth in due course, and it proves to be *Chloridea obsoleta* (Fabr.) var. *umbrosa* (Grote)—more generally known as *Heliothis armigera umbrosa*. The insect is common, but I had not before known it to attack the orange.—T. D. A. COCKERELL.

CAPTURES AND FIELD REPORTS.

NOTES ON THE SEASON 1905.—Although I have not taken any special notice of the Rhopalocera during this season, except, perhaps, of the Hesperids, I think more butterflies have come under my notice this year in England than for many years past. Almost every plant of *Rhamnus* noted in Surrey or Sussex was tenanted by *Gonepteryx*

rhamni, either in the egg or larval stage. Perhaps the spring brood of *Cyaniris argiolus* was not quite so common in Chiswick as it was a year or two ago, but some specimens were seen of the July brood, which is here usually very scarce. *Pieris rapæ* has been as abundant as usual, but *P. napi* and *P. brassicae* have not perhaps occurred in their usual quantity in this neighbourhood. *Cenonympha pamphilus* was very abundant in Richmond Park, and *Aphantopus (Epinephele) hyperanthus* in plenty at Chalfont Road. But perhaps the most unusually abundant species is *Aglais (Vanessa) urticae*. The first seen was at Clandon, July 15th, and several have been seen, even at Chiswick, since. There were eight fine specimens, probing the blossoms of *Sedum telephium*, in the garden on September 13th. Though common enough elsewhere, such a congregation is rare within six miles of Charing Cross. *Pyrameis atalanta*, too, is certainly more numerous than it has lately been in this district. *Pamphilus sylvanus* was really numerous on Putney Heath towards the end of July. I noticed a specimen, on August 5th, resting quite exposed on a bramble-leaf, with the wings closed over the back while the rain was falling fast; but though the leaf was wet, the butterfly was perfectly dry. I should have expected it would have crept under the leaf. Among the Heterocera the larvæ of *Phalera bucephala* have been an exceptional plague in the gardens here, on rose, lime, and birch. Their habit of stripping certain branches on one side of the trees causes the shrubs to become very unsightly. The larva of *Mamestra trifolii (chenopodii)* has been quite common on its food-plant, but I have only seen one larva of *Pelurga comitata*. On the walls and fences in the neighbourhood a few *Catocala nupta* appear every year, but this year the number has been quite doubled. The larvæ of *Acronycta aceris* have also been rather commoner than usual. This species, both here and on the Continent, appears to be quite suburban. After having been almost scarce for the last two or three years, the larva of *Spilosoma menthastri* is again becoming common.—ALFRED SICH; Corney House, Chiswick, September 15th, 1905.

NOTE ON SECOND EMERGENCES.—It would be interesting to know the experiences of other entomologists as to second emergences this season. I have had the following:—On August 20th, *Stauropus fagi*, and a few days later a second example; *Pterostoma palpina* in August, date not noted; on September 11th, *Hypena proboscidalis*; and on August 26th I found a larva of *Porthesia similis (auriflua)* half grown, which spun its cocoon on September 2nd and is now a pupa, and the imago will doubtless emerge shortly.—FRANCIS C. WOODBRIDGE; Northcroft, Uxbridge.

PARTIAL SECOND BROOD OF *PSEUDOTERPNA BAJULARIA*.—On July 5th last, at 10 p.m., I took a female of the above, and obtained ova. These hatched on the 12th of that month, and were fed in a glass cylinder indoors on oak (the room faced north-east). Some of the larvæ fed up much quicker than others—in fact, to-day, September 11th, to my great surprise, a beautiful male specimen (full-sized) emerged, and yet some of the larvæ are still very small, and have every appearance

of hibernating as larvæ. Is not this very unusual? — ARTHUR BORDU; 39, Elm Grove Road, Barnes, S.W., September 11th, 1905.

SPHINX CONVULVULI AT BOURNEMOUTH.—I had a male specimen of *S. convulvuli* sent me on August 25th, which had been found resting on the front door of Linden Hall, Bournemouth, by the hall porter, on opening it in the morning. It was in good condition when found, but was sent to me in a small box, alive, and on its arrival it was much damaged.—C. B. HOLLAND; 12, Lawson Road, Sheffield, August 29th.

ACHERONTIA ATROPOS IN LONDON.—This morning I have had a fine specimen of *A. atropos* brought to me. It was taken on the stonework of Westminster Bridge.—J. MILLER; 44, Longfield Street, Wandsworth, S.W., September 1st, 1905.

PLUSIA MONETA IN LEWISHAM. — On the evening of August 29th last Mrs. Chittenden was passing under the electric lights in High Street, Lewisham, when she saw a moth flying just above the pavement. Claspings hands together, she caught the insect, and brought it home. I at once saw that it was a specimen of *P. moneta*, and, although it was damaged, the fringes were in good condition. — D. CHITTENDEN; 98, Court Hill Road, Lewisham, S.E.

SECOND BROODS OF LEPIDOPTERA. — Has it been noticed elsewhere that there were an unusual number of, apparently, second broods of Lepidoptera this year? Such occurrences have been quite a feature in this district.—G. BROOKS; Ivyside, North Finchley.

[Perhaps our correspondent will kindly supply further details, as the subject is of considerable interest.—Ed.]

NOTES FROM ESSEX. — I went over to Foulness on Sept. 22nd last, more for the purpose of having a look round than for specimen hunting. I noticed many webs of *Porthesia chrysorrhæa* on the whitethorns; a case of *Epichnopteryx pulla* on one of the sea-wall grasses; a larva of *Pseudoterpna smaragdaria*; two or three cases of *Coleophora artemisiella*, and evidence of the presence of *Catoptria candidulana* among the flowers of sea-wormwood; a larva of *Cucullia asteris* on flowers of sea-aster; and, on the church wall, a defunct pupa of *Vanessa urtica*. Although Foulness is rather difficult of access, I hope next season to see a good deal more of it. The fine show of *Aster tripolium* was, in my opinion, well worth the visit, apart from the novelty of half an hour's drive across the sands from Wakering Stairs.—F. G. WHITTLE; 7, Marine Avenue, Southend, Sept. 24th, 1905.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—July 18th, 1905.—Mr. Hugh Main, B.Sc., President, in the chair.—Mr. Joy exhibited larvæ of *Thecla rubi* feeding on the berries of buckthorn. He had also found them feeding on the buds of bramble and

dogwood. They made holes to extract the contents.—Mr. Stonell, an *Abraxas sylvata* (ulmata) taken recently in the Clapham Road.—Mr. Sich, the ova of *Coleophora gryphipennella* on a rose-leaf. It was an upright egg and abundantly supplied with gum.—Mr. Main, living larvæ of *Papilio machaon* at different ages; and also an old stem of an umbellifer, containing cells of a species of carpenter-bee.—Mr. Step distributed copies of the photograph of the members who attended the field-meeting at Seal Chart on May 27th.

July 27th.—The President in the chair.—Mr. Carr exhibited the larvæ of *Epione advenaria*, from Seal.—Mr. Stonell, a putty-coloured larva of *Odontopera bidentata*, from Yorkshire; and reported that he had taken a fair number of *Cænobia rufa* at Worcester Park.—Mr. Main, a photograph of a colony of the larvæ of *Eugonia* (*Vanessa*) *polychloros* in the New Forest, from which larvæ he had already bred more than sixty imagines.—Mr. Noad Clark, photographs of (1) the ova *Coleophora gryphipennella* on leaves of rose; (2) a much-magnified photograph of the micropyle of the same; and (3) the ova of *Ægeria* (*Sesia*) *chrysidiiformis*.—Mr. Sich said that the larva of *C. gryphipennella* was at first a true miner, boring direct from the base of the ovum into the leaf.

August 10th.—The President in the chair.—Mr. Main exhibited the larvæ of *Hadena contigua*, from ova laid by a female specimen obtained in the New Forest. The colour-variation was most extreme.—Mr. Sich, living larvæ of (1) *Nisoniades tages* and (2) *Syrichthus malva*, both feeding well on garden strawberry. They fed at night and retired in the daytime into "tents" of leaves loosely spun together. The former hibernated as a larva, the latter as a pupa.—Mr. West (Greenwich), two very local species of Hemiptera, taken at Yarmouth in July; *Gnathoconus picipes*, at roots of violets; and *Chorosoma schillingii*, on marram grass. Mr. Turner, (1) a species of *Ædipoda* which was very common at Gavarnie in the Hautes Pyrénées, and (2) a living specimen of *Locusta viridissima* taken by him at the same place. A discussion took place as to the latter species, and it was considered to be carnivorous rather than vegetarian in its diet.—Mr. R. Adkin read a short note from Mr. Kirkaldy on "The Entomology of the Lowlands of Oahu (Hawaiian Islands)."—HY. J. TURNER, *Hon. Rep. Secretary*.

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Sept. 5th, 1905.—The President in the chair.—The Rev. G. H. Raynor and Mr. Charles Capper were nominated for membership of the Society.—Rev. C. R. N. Burrows exhibited living pupæ of *Ochria ochracea* taken in thistle-stems at Mucking, Essex; he remarked on the fact that in this district the species does not seem to feed on burdock (*Arctium lappa*) or mugwort (*Artemisia vulgaris*).—Mr. J. A. Clark, *Lycana icarus* from Folkestone, including abs. *obsoleta* and *striata*.—Mr. A. W. Mera, *Acidalia rusticata* bred from larvæ reared on dandelion; the specimens were generally considered to be larger than the average of captured imagines. Mr. Mera also exhibited *Agrotera nemoralis* from Brentwood, a capture he considered somewhat remarkable for this locality.—Mr. V. E. Shaw (on behalf of Mr. Newman, of Bexley), two hybrid imagines, the offspring of *Notodonta dromedarius*, female, and *N. ziczac*, male; the exhibitor stated that part of the brood emerged in the autumn of

1904, and proved to be all females; while the balance hibernated as pupæ, and emerged during May, June, and July, all being males.—Rev. G. H. Raynor reported that the second brood of *Cyaniris argiolus* had been abundant at Maldon; he found that the larvæ fed up readily on unopened buds of ivy. — Mr. C. P. Pickett, during a recent visit to Torquay, had observed large numbers of *Pyrameis cardui* and *Vanessa urticae* visiting the valerian that grows on the rocks in this district.

Sept. 19th.—The President in the chair.—Rev. G. H. Raynor and Mr. Chas. Capper were unanimously elected members of the Society.—Rev. C. R. N. Burrows exhibited a very dark aberration of *Notodonta ziczac*, and a very pale form of *Hadena sordida*; also living larvæ of *Cerura furcula*, *N. ziczac*, *Pterostoma palpina*, *Lophopteryx camelina*, and *Gastropacha quercifolia* (all from Mucking, Essex).—Mr. J. A. Clark, a very pale ab. of *N. ziczac* and a dark specimen of *Calymnia trapezina*.—Mr. A. W. Mera, female specimen of *Porthesia similis* with a black spot at the base of fore wings. — Mr. W. J. Kaye, a bred series of *Thecla pruni* from larvæ taken at Monkswood, Herts; four examples of *Macaria liturata*, ab. *nigrofulvata*, from Delamere, Cheshire; and a long and variable bred series of *Zonosoma pendularia* from Oxshott. Mr. Kaye mentioned that the emergence of the *T. pruni* extended over three weeks from June 15th onwards, and pointed out that three of the *Z. pendularia* were part of a second brood, the remainder of which was still in pupa. — Mr. C. P. Pickett, an abnormally large specimen of *P. cardui*, some unicolorous chocolate-coloured abs. of *Ematurga atomaria*, and several abs. of *Lycena corydon*, one of which had the dark marginal band on the right fore wing about twice as deep as that on the left wing.—Mr. V. E. Shaw, living imagines of *Oenophila v-flava* taken in a city wine-vault, the larvæ of this species feeding on corks in wine-bottles; also *Spilote (Abraxas) grossulariata* var. *varleyata*.—Rev. C. R. N. Burrows reported that sugaring in the Mucking haunt of *Cirrhædia xerampelina* had proved a complete failure.—Mr. J. A. Clark recorded the capture of *Peronea cristana* in Epping Forest. — The Honorary Secretary drew attention to the fact that sugaring in the New Forest was now prohibited by order of the Deputy Commissioner of Woods and Forests in that district, the rangers having been instructed to daub clay on the sugar patches in the event of their warning to any individual lepidopterist being ignored. Mr. P. H. Tautz confirmed this by stating that he had been interrupted recently while sugaring in the Forest.—S. J. BELL, *Hon. Sec.*

RECENT LITERATURE.

A Catalogue of the Erycinidæ. By LEVI W. MENGEL. Pp. 161. Reading, Pa., U.S.A. 1905.

THE author of this valuable catalogue is to be congratulated on the completion of his laborious undertaking; he has earned the thanks of all students of the Erycinidæ (=Lemoniidæ, Kirby, = Riodinidæ, Grote). Although he holds the opinion that there are too many genera, and that the number of species should be much reduced, he leaves everything pretty much as he found it.

A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By JOHN E. ROBSON. Vol. ii.—Micro-Lepidoptera. Part i.—Pyralidina and Tortricina. Pp. 106. [Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne. Vol. xv., part i.] Williams & Norgate, London. 1905.

AGAIN we have to compliment the author on the very satisfactory manner in which he has brought his work to its present stage. "Micro" Lepidoptera are not favourites with the collector generally, and the consequence of this is that the distribution in Britain of the Pyralidina, Tortricina, and Tineina is only imperfectly known. This unfortunate state of things has created a difficulty with which Mr. Robson had to contend in the compilation of the instalment of this list under notice. He has managed, however, to get information as to the occurrence of nearly two hundred species of Tortricina in the area discussed. Under Pyralidina seventy-six species are treated, but of these some had been referred to in previous sections, and one or two belong to the Noctuina. We shall be glad to see the remainder of this important catalogue.

The Insects of Jethou, pp. 1-8; *The Insects of Herm*, pp. 1-14; and *the Fauna and Flora of the Sarnian Islands*, pp. 1-6.

The above are three reprints from the 'Transactions' of the Guernsey Society of Natural Science for 1904. The first two are by W. A. Luff, but the third is without compiler's name.

Transactions of the Hertfordshire Natural History Society and Field Club. Edited by JOHN HOPKINSON, F.L.S., F.G.S., &c. Vol. xii., part iv, pp. 137-168. London: Dulau & Co. 1905.

AMONG the contents are several papers on entomological subjects; two of these deal with the Coleoptera found in the county, one by Mr. A. E. Gibbs and the other by Mr. E. George Elliman. The former author also gives some very interesting notes on Lepidoptera observed in Hertfordshire in the year 1904, a *résumé* of which was published in this Journal last year (xxxvii. 139). There is also "Notes on Variation in *Melitæa aurinia*," by Mr. V. P. Kitchin, which is accompanied by a plate.

Transactions of the City of London Entomological and Natural History Society for the year 1904. Pp. 1-56. The Society: London Institution, Finsbury Circus, E.C.

In addition to a large amount of exceedingly useful matter comprised in the "Reports of Meetings," the present volume contains the following papers:—"Are the attacks of Lepidopterous Larvæ beneficial to the plants they attack?" by Dr. Chapman; "*Venusia cambrica* and its Allies," and "Supplementary Notes on *Cidaria*," both by Mr. L. B. Prout; and "Aid to the Study of Lepidopterous Leaf-miners," by Mr. Alfred Sich. All these are of much importance to the student, and will be of considerable interest generally.

OBITUARY.

WE deeply regret to announce the death of Mr. AMBROSE QUAIL at Tamworth, New South Wales, on the 11th of February, 1905, at the early age of thirty-three.

He had to leave England some nine years ago owing to the breakdown of his health, and resided for some years at Palmerston North, New Zealand. Unfortunately a series of bad seasons caused a return of his complaint, and after a brief visit to England in the autumn of 1903 he returned to the colonies, obtaining some benefit from a short residence in Queensland, but dying six months after taking up work at Tamworth.

Mr. Quail was a rising and brilliant student belonging to the newer school of lepidopterists, following the methods of Drs. Dyar and Chapman in larval and pupal description; and there is no doubt that had he lived he would have occupied a place in the foremost ranks of entomologists. Added to great keenness of observation and wonderful patience in his researches, he was also possessed of remarkable skill as a draughtsman, as the profuse and beautiful plates illustrating his papers testify. His published contributions include several papers in the 'Transactions' of the Entomological Society of London, others appearing in the pages of this Journal, 'Natural Science,' and the 'Entomologists' Record.' He also contributed to the 'Proceedings' of the Royal Society of Queensland, and the 'Transactions' of the New Zealand Institute. The latest and probably best known of his work was that dealing with the Hepialidæ and Cossidæ, groups that had always been especial favourites, and which his residence in Australia and New Zealand afforded him special opportunities to study. His loss is keenly felt by all who were personally known to him, and it will be a matter of regret to the wider circle of his readers that so energetic and capable a personality was not longer spared to enrich the world's knowledge in his special line of research.

JOHN WILLIAM DOUGLAS passed away, at the ripe age of ninety years, on August 28th last. Although perhaps chiefly interested in Coleoptera, Hemiptera, and Lepidoptera, almost all orders of the Insecta received some share of his attention. He contributed important monographs and other valuable writings to the 'Transactions' of the Entomological Society of London, the 'Entomological Magazine,' the 'Zoologist,' and the 'Entomologist's Monthly Magazine.' He was part author of the 'Natural History of the Tineina' (13 vols., 1855-1878), and, in conjunction with Scott, produced 'British Hemiptera-Heteroptera' (1 vol., 1865). In 1856 he published 'The World of Insects,' a small but excellent entomological manual. He was co-editor of the 'Entomologist's Monthly Magazine,' and in this position he had been associated with the Journal from the year 1874, when Dr. Knaggs terminated his connection with it. He had been President, and also Honorary Secretary, of the Entomological Society of London, to which he was elected in 1845. Few men have done so much to foster or awaken appreciative interest in the world of insects.

THE ENTOMOLOGIST

VOL. XXXVIII.]

NOVEMBER, 1905.

[No. 510.]

ABERRATION OF *EUCHELIA* (*HIPOCRITA*) *JACOBÆÆ*.



MR. FORSYTHE, of Lancaster, has sent for inspection a most interesting series of *E. jacobææ* that he had obtained in the early part of June last. In all the specimens the ground colour is much greyer than usual, some being especially pale in coloration. In these paler examples the hind wings are pale pink, the subcostal streak and the two outer marginal spots being still paler pink.

He also sent the specimen referred to *ante*, p. 185, and this, as will be seen by the excellent figure drawn by Mr. H. Knight, is a remarkable aberration of this usually constant species. The crimson subcostal streak is continued to subapical spot, and the immediate area below it is thickly powdered with crimson scales, as also are the outer and inner marginal areas.

The late Mr. W. Fowler once sent us a somewhat similar specimen of *E. jacobææ*, but it was without the crimson powdering on the marginal areas.

RICHARD SOUTH.

ORTHOPTERA IN 1904.

By W. J. LUCAS, B.A., F.E.S.

THOUGH no addition was made during 1904 to the list of British Orthoptera, yet one event of more than ordinary interest



occurred in the rediscovery of the earwig *Apterygida media* (= *albipennis*) in Kent. About 1840, in June, the late Prof. Westwood took a few specimens near Ashford; but the insect was not again met with, and it was feared that we could no longer claim it as British. About 1889, however, Mr. J. Edwards took a pair near Norwich; but again no more were taken, until Mr. A. J. Chitty found them plentifully in the autumn of last year in the same district in which Westwood obtained them more than half a century before. Mr. Chitty tells me that they occur throughout the district in suitable localities, which appear to be in the valleys where the soil is light and chalky, and where there is plenty of vegetation. They are generally on the sunny

side of the valley, or at any rate sun seems necessary for them. A few were found in an old stump; but they are generally obtainable by sweeping herbage, especially where plants like marjoram are growing. The largest haul was from some hop-bines after the hops had been picked; but they had previously been swept from the sunny bank below the hedge of this hop-garden. The female is more abundant than the male. They occur with the common earwig, *Forficula auricularia*.

A. media is smaller and brighter in colour than *F. auricularia*, and the male forceps are very different from those of the latter. The figure, however, will shew the difference better than a description. The male forceps of *Chelidura arachidis* resemble somewhat those of *A. media*, but *arachidis* is much smaller, and, being an alien from a warmer clime, does not venture out of doors in the two or three localities in which it is found. In ordinary circumstances *A. media* keeps its forceps spread open, not more or less closed at the tip, as is the custom with the common earwig.

At Queenborough Commander Walker found *Anisolabis annulipes* and *Chelidura arachidis* still holding their own, while the

same strenuous entomologist added Oxfordshire to the list of counties in which *Forficula lesnei* was known to occur, by taking it at Beckley on September 10th.

Twice during August the locality near Christchurch was visited for the shore earwig, *Labidura riparia*, and specimens were found without much difficulty. Often their presence might be guessed by small holes in the sand leading under the stones beneath which they pass the day. When two are found together in one lair, they seem to be male and female. On being exposed to the light the hind part of the abdomen, with the forceps, is often thrown back, giving the insect a very strange appearance—this being, no doubt, a “terrifying attitude.” Several immature examples were found, one being very tiny. One such, obtained on August 12th, was very white, the point of the face and the tips of the forceps, however, being slightly darker, and the eyes quite dark. Some kept in captivity ate meat, rice-pudding, and banana, but would not touch grass. On one occasion, after fasting for twenty-four hours, a female seized a cinnabar moth (*Euchelia jacobææ*) larva of fair size and commenced eating it at the head. It held the caterpillar with the forceps, and seemed to be purposely stretching it. Sometimes it appeared to experience a difficulty in getting its forceps free. Another female came up, when a fight with the forceps commenced between them. They went more or less backwards to the attack, the head, however, being turned a little on one side, so that they might see what they were doing. After a time two females and an immature specimen were eating at the same larva, but not then holding it with their forceps. Notwithstanding the fact that it was a cinnabar larva—orange and black—they ate of it greedily; but another cinnabar larva put in with a male and a female was not touched, though left with them all night.

As regards the cockroaches, little was noted. An immature *Ectobia panzeri*, which seems to be essentially a coast species, was taken in the south of the New Forest on August 26th. On September 8th Mr. H. Main gave me a prettily marked but wingless and apparently immature cockroach, which arrived in a sugar vessel from Java. It died without maturing on January 5th, 1905. Mr. E. J. B. Sopp received from Liverpool Docks on December 30th five *Blatta americana* (including one large nymph and one female with oötheca protruding) and one *Leucophaea surinamensis*. Apparently they were introduced amongst grain from San Francisco. No doubt numbers of Orthoptera are introduced in this way every year. It is always interesting to note them, but they are seldom likely to affect our fauna. Occasionally, of course, one may come to stay, as did *Blatta orientalis*, *B. americana*, *B. australasica*, and *Phyllodromia germanica*, and as possibly *L. surinamensis* may succeed in doing; but climatic conditions are usually quite unsuitable.

It is not till about mid-July as a rule that we begin to find mature grasshoppers. In 1904 I noted them first at Oxshott on July 15th, the species being *Stenobothrus viridulus*, *S. parallelus*, and *Gomphocerus maculatus*. At Merrow Downs, near Clandon, the somewhat rare *S. lineatus* was taken on July 26th (one female). *S. rufipes* was found on August 9th at one spot amongst heather by the side of a fairly open stream in the New Forest. It is perhaps usually found in the rides, or by the margin, of a wood. *Mecostethus grossus* was, as usual, plentiful in August in the New Forest, and was discovered in at least one entirely new locality. On September 11th, at Bookham Common, I for the first time met with *Gomphocerus rufus*. The male is readily known by the heavily clubbed antennæ, the club being dark with a pale tip. In the female the club is much less pronounced, while the wings do not quite reach to the apex of the abdomen. In this latter point the females somewhat resemble the same sex of *Stenobothrus elegans*, but one glance at the pronotum will prevent confusion with females of that species. There were noted from Beachy Head *Stenobothrus parallelus* (R. Adkin), and in addition *S. bicolor* and *S. viridulus* (F. Stevens). Of the long-horned grasshoppers, *Platycleis grisea* was taken amongst the débris fallen from the cliffs near Milton in Hants; and Rev. F. C. R. Jourdain reports *Thamnotrizon cinereus* as common at Broadwindsor, in Dorset, between September 15th and 17th. The last grasshoppers noted were *Gomphocerus maculatus*, Esher Common, Surrey, on September 21st, and *Meconema varium*, near Oxshott, on October 1st. *Stenobothrus parallelus*, *S. viridulus*, and *Gomphocerus rufus* fed readily on grass in captivity, holding the blade with the fore legs, and eating downwards along the margin.

Concerning the crickets there is nothing to relate, except that about half-grown specimens of *Nemobius sylvestris* were found in the New Forest in April.

DESCRIPTION OF FIGURES.—1. Forceps of ♂ *Forficula auricularia*. 2. Forceps of ♂ *Apterygida media*. 3. Forceps of ♂ *Chelidura arachidis*.

DESCRIPTION OF A NEW GENUS AND SPECIES OF BRACONIDÆ FROM CAPE COLONY.

By P. CAMERON.

Holcalysia, gen. nov.

♂. Antennæ 26-jointed, longer than the body; the joints elongate, the third distinctly shorter than the fourth. Mandibles bidentate; the upper tooth large, gradually narrowed, the lower short, bent inwardly. Occiput not margined. Eyes large, oval; the malar space short. Parapsidal furrows short, narrow; beyond them, and reaching to the scutellum, is a long deep depression or fovea, deepest in the centre and narrowed at the base and apex. Scutellum large, not much

raised. Post-scutellum raised, conical, clearly separated. Lower part of mesopleuræ with a large, long, deep depression or furrow. Radial cellule long, reaching to the apex of the wings; it issues from shortly beyond the middle of the stigma; the first abscissa is minute. Stigma large. There are two transverse cubital nervures; the first cubital cellule is the smaller, the third the largest. Transverse median nervure received shortly beyond the transverse basal; the recurrent nervure is interstitial. Second discoidal cellule open at the apex below; the discoidal nervure is received beyond the recurrent nervure. The cubitus and radius in hind wings do not reach to the apex of the wing. Palpi long, slender; the maxillary 6-jointed. The second abscissa of the radius is longer than the first transverse cubital nervure; the cubital cellules are separated from the discoidal. The second abdominal segment is smooth and shining like the others; it has no transverse furrow. The large radius is gradually narrowed towards the base and apex. In the hind wings there is a closed præbrachial cellule; below it are two cellules, a shorter closed basal and a longer apical one open at the apex below.

Characteristic of this genus is the strongly tuberculate or raised post-scutellum. The only genus with this feature is *Hoplitalysia*, Ashm., but that differs in some essential particulars from the genus here described. In the table of Szepligeti (Gen. Braconidæ, p. 202) my genus would run near to *Phanocarpa* and *Adetura*, but these genera have not a tuberculate post-scutellum. The large deep central furrow on the apical half of the mesonotum is noteworthy.

Holcalysia testaceipes, sp. nov.

Black, shining; the outer orbits, except at the centre of the eyes, the inner more narrowly and more obscurely, the oral region and mandibles, rufo-testaceous; the palpi and legs of a paler, more yellowish testaceous colour; wings hyaline, the nervures and stigma black; the apical and transverse nervures paler; the antennæ are thickly covered with white pubescence. ♂. Length, 4 mm.

Antennæ longer than the body, smooth and shining; the mesonotum at the sides of the scutellum, the median segment and the basal abdominal segment closely, strongly aciculated. The large, wide mesopleural depression is also aciculated; in it, near the middle, are two clearly separated, not very distinct, keels; at the upper side of the apex is a distinct furrow; the upper side of the apex is longer than the lower, it being obliquely sloped. The first abdominal segment is about two and a half times longer than wide; the centre is raised; the depressed sides finely, closely, longitudinally striated.

NEW NAMES FOR HYMENOPTERA.

Zethoides, Cam. (Trans. Am. Ent. Soc. xxx. 93) non Fox = *Plesiozethus*, Cam.

Nomia metallica, Cam. (Proc. Zool. Soc. 1901, 247) non Smith = *N. Willeyi*, Cam.

Cerceris himalayensis, Cam. (Ann. Mag. Nat. Hist. Feb. 1905) non Bing. = *assamensis*, Cam.

NEW AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. COCKERELL.

Paracolletes roseoviridis, n. sp.

♂. Length about 8 mm.; in all respects very close to *P. carinatus*, Ckll. (from Queensland), but differing thus: more robust, with a broader abdomen; head, thorax, and abdomen yellowish green instead of blue-green, the abdomen with the hind margins of the first two segments, and all the segments beyond, suffused with a rosy tint, which covers the fourth and fifth segments with a rich glow, and shows a little purple; stigma more brightly coloured; second submarginal cell less narrowed above; second recurrent nervure joining third submarginal cell a little distance from its end (at its end in *carinatus*); area of metathorax not only transversely carinate, but also with conspicuous transverse grooves or deep striæ, especially just below the keel; hind tibiæ and anterior tibiæ in front, ferruginous, but the middle tibiæ, and anterior tibiæ behind, dark; hind femora ferruginous, with the basal half strongly suffused with black. Other characters are: hair of face and thorax above light fulvous or orange-tinted, but that of vertex long and grey-black; flagellum brownish beneath, the last joint a little rufescent; b. n. meeting t. m.; first r. n. joining second s. m. at its middle; wings clear; tarsi ferruginous; lateral pieces of genitalia shaped rather like the end of a finger seen in outline, fuscous basally and subhyaline apically; median piece with its rounded apical part dark reddish centrally, and hyaline at the margins; nearly the lower half of clypeus black, but the rest green.

Hab. W. Australia, 68.6. The numbers cited are the accession numbers of the Museum.

Halictus dampieri, n. sp.

♀. Length about 6 mm.; head and thorax dark olive-green, the front and mesothorax dullish, with a satiny lustre; apical part of mandibles reddish; antennæ entirely dark; clypeus shining black, with a few punctures, except its upper margin, which is broadly green; tegulæ rufous, blackened basally; area of metathorax large but not well defined, coarsely granular, with an inconspicuous and minute subreticulate sculpture; wings quite clear, brilliantly iridescent, stigma and nervures dark fuscous; b. n. falling some distance short of t. m.; first r. n. meeting second t. c.; third t. c. and second r. n. very weak; legs black, with white hair, yellowish on under side of tarsi; claw-joints ferruginous; hind spur with short stout spines; abdomen dark green, practically hairless, except at the apex, though there is a fringe of hair along the lateral margins, at the dorso-ventral suture. With the compound microscope, the front and mesothorax are seen to be very minutely tessellate all over, with very few scattered shallow punctures; the area of metathorax is evidently reticulate in the middle, the reticulations weakening and giving way to spots and dotted striæ laterally; the surface of the abdomen is impunctate, and covered

all over with very minute cross-striæ, which are here and there joined by short lines, like the elongate cells in the stem of a plant.

Hab. Queensland (Gilbert Turner; Ridg. 5. 91, 706). Allied to *H. floralis*, Sm., but readily known by the dark colour of the thorax. From *H. flindersi* and *H. murrayi* it is readily known by the granular (not coarsely wrinkled) appearance of the area of metathorax. It will be observed that this and the following species of *Halictus* are named after Australian explorers.

The genus *Halictus* is so large, and many of the species are so much alike, that the ordinary methods of description are often unsatisfactory. I find that the use of the compound microscope reveals details of sculpture which are of great assistance in defining the species, and it seems that this method of examination should be generally employed.

The small group of Australian species having metallic (blue or green) colours on the thorax exhibits the following microscopical characters:—

(1.) *Sculpture of front.*—The front in *H. dampieri* is minutely tessellate, with very few shallow punctures; in *H. flindersi* and *H. murrayi* it is coarsely striate, but with this important difference, that in *flindersi* the striæ are transverse just below the central ocellus, and just below this is a delta-shaped space without regular striæ; whereas in *murrayi* the striæ run right down from the central ocellus, covering the surface.

(2.) *Sculpture of mesothorax.*—In *H. dampieri* minutely tessellate, with very few scattered punctures; in *H. flindersi* ♀ minutely tessellate, with short transverse plicæ at the places of insertion of the hairs, becoming more distinct in the ♂, which has quite long and very distinct plicæ, more or less oblique. In *H. murrayi* and *H. urbanus baudinensis* the mesothorax is coarsely microscopically tessellate, with numerous distinct punctures superimposed. For the most part these punctures are about as far apart as the breadth of one, or perhaps a little more distant.

(3.) *Sculpture of second abdominal segment.*—In *H. dampieri* and *H. flindersi* transversely striatulate, with oblique cross-lines, rather more numerous in the latter. *H. flindersi* also has some very faint punctures about the middle.

Halictus flindersi, n. sp.

♀. Length 6 mm. or a little more; head, thorax, and abdomen shining purple-blue, the upper part of the clypeus and the anterior part of the mesothorax peacock-green, and the face in general more or less green; pubescence white, long, and abundant, the hairs with curled ends, on the under side of the abdomen, but elsewhere only moderately abundant; apical half of mandibles dark reddish; antennæ dark, the flagellum dull reddish apically beneath; mesothorax shining, with the median impressed line distinct; metathorax truncate, the truncation with a sharp edge, the area strongly longitudinally (antero-posteriorly)

ridged; legs black, with quite abundant greyish-white hair, that on tarsi beneath yellowish, the basal joint of hind tarsi with a conspicuous little orange brush at its apex; hind spur with three strong teeth; tegulæ shining piceous, more rufous behind; wings clear; stigma and nervures fuscous; stigma very large; basal nervure very strongly bent, falling a rather long distance short of t. m.; first r. n. meeting second t. c.; second r. n. and third t. c. subobsolete; abdomen shining, almost free from hair above except apical segment, which is very hairy; no hair-bands or patches.

♂. Length scarcely over 5 mm., more slender; abdomen darker, little metallic; thorax greener, but vertex dark blue; clypeus without yellow or white; antennæ coloured as in female.

♀, var. a. Mesothorax and scutellum entirely Prussian-green.

Hab. Queensland (Gilbert Turner, Seaf. 1. 90; 440 and 439). Both sexes, and the two forms of the female, were evidently taken at the same time and place.

Halictus murrayi, n. sp.

♀. Length about 5 mm.; head and thorax dark blue, granular, and little shining; clypeus largely purplish; anterior part of mesothorax rather shiny, with blue-green tints; legs and abdomen piceous or brown-black; pubescence white, short and not dense, not forming bands or patches on the abdomen; apical part of mandibles reddish; antennæ black as far as third joint (the rest broken off); head broad; area of metathorax with strong ridges, the intervals wrinkled; tegulæ small, reddish; wings clear, faintly dusky apically, nervures and stigma very dark brown; stigma very large; b. n. falling a long way short of t. m.; first r. n. meeting second t. c., but a little on the outer side; second r. n. and third t. c. very weak; abdomen with much white hair beneath.

Hab. Adelaide River (J. J. Walker, 5138). Structurally allied to *H. urbanus baudinensis*, but that has the tegulæ, tibiæ, and tarsi clear red, which is not at all the case in *murrayi*. There is also some resemblance to *H. inclinans*, Sm., and *H. limatus*, Sm.

The following series of species has the thorax black, not metallic* :—

- | | |
|--|-------------------------------|
| All the tibiæ and tarsi clear ferruginous; hind margins of abdominal segments more or less pallid or reddish | 1. |
| Not so; legs dark, and abdomen without colour-bands | 2. |
| 1. Larger, abdomen with broad reddish bands (Melbourne) | |
| | <i>bicingulatus</i> , Sm., ♀. |
| Smaller, abdomen with obscure bands (Adelaide) | <i>oxleyi</i> , Ckll. |

* While on black *Halictus*, I will take the opportunity of stating that *Lucasius*, Dours, the name of a subgenus of these bees found in Europe, is a homonym, and may be altered to *Lucasiellus*. The first use of the name *Lucasius* was in Crustacea (1859).

2. Abdomen with distinct hair-bands, or lateral patches
at the bases of the segments 3.
Abdomen without hair-bands or patches. Spp. to be treated later.
3. Size very small *humei*, Ckll.
Size medium 4.
4. Male; more hairy; area of metathorax rugoso-re-
ticulate *lanuginosus*, Sm.
Females; less hairy; area of metathorax striate 5.
5. Thorax very coarsely sculptured (Victoria) . . . *gilesi*, Ckll.
Thorax finely sculptured (Hobart, Tasmania) . . *repræsentans*, Sm.

(To be continued.)

A BUTTERFLY HUNT IN THE PYRENEES.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 249.)

The collecting ground here is not easy to discover at once, so much have the market and villa gardens encroached upon the heaths of late years. A morning at Anglet was wasted in the attempt to find a suitable country, and it was more by accident than intention that I struck a really good locality to the south of the town on the road to St. Jean de Luz, and hard by the Bois de Boulogne. I spent an afternoon and morning on the boggy slopes which extend from the pine woods to the bamboo swamps, now more or less composed of oozing mud. Among the heather *Satyrus dryas* was flapping heavily, while *S. arethusa* was enjoying a sun-bath wherever there was an interval of dry sand. But *Cænonympha ædippus*, which haunts the damp and shady hollows, was nowhere to be seen. One worn female, however, which I kicked up from the grass, revealed the fact that I was too late for the species, and the same may be said of *Heteropterus morpheus*, for, though I took a dozen or so of these odd butterflies, they were nearly all worn to rags, and therefore liberated. *Lampides boeticus*, again, presented the same lamentable appearance, but among a host of *Cyaniris argiolus* I took a splendid fresh male *Lycænaalcon*, for which Biarritz is not given as a locality by M. Rondou, though Mr. Elwes mentions it among his captures there in July, 1886. The next day the weather broke up, and, as there seemed no chance of an immediate improvement, I turned northwards on the 5th, well satisfied with the results of my wanderings, both entomological and otherwise. Not counting varieties and local forms, M. Rondou includes 158 species in his catalogue of the Rhopalocera of the Pyrenees. I took or observed 109 in what was little more than a fortnight's collecting, made up as follows:—

PAPILIONIDÆ.—*Papilio podalirius*, *P. machaon*, *Thais rumina* var. *medesicaste** (Vernet), *Parnassius apollo*.

PIERIDÆ.—*Aporia crategi*, *Pieris brassicæ*, *P. napi*, *P. rapæ*, *P. callidice*, *P. daphidice* (Villefranche), *Euchloë cardamines** (Cauterets), *E. euphenoides* (Vernet), *Leptidia sinapis* var. *diniensis* (Vernet), *Colias phicomone* (Canigou and Gavarnie), *C. hyale* (Andorra), *C. edusa*, *Gonepteryx rhamni*, *G. cleopatra*.

NYMPHALIDÆ.—*Limenitis camilla** (Vernet), *Pyrameis atalanta*, *P. cardui*, *Vanessa io*, *V. urticæ*, *V. polychloros*, *V. antiopa*, *Polygonia c-album*, *Melitæa phæbe*, *M. didyma*, *M. deione*, *M. athalia*, *M. parthenie* and var. *varia*, *M. dictynna*, *Argynnis selene* (Canigou and Biarritz), *A. euphrosyne*, *A. pales*, *A. dia*, *A. ino* (Vernet), *A. daphne*, *A. lathonia*, *A. aglaia*, *A. niobe* and ab. *eris*, *A. adippe*, *A. paphia*, *Melanargia lachesis* and var. *canigulensis*, *M. galatea*, *Erebia epiphron* var. *pyrenaica*† and var. *cassiope*, *E. stygne*, *E. evias* (Vernet), *E. lefebvrei*† and var. *pyrenæa*,† and (?) var. *intermedia*,† *E. gorgone*,† *E. gorge*, *E. euryale** (Vernet), *E. lappona*, and (Gavarnie) var. *sthenno*, *E. tyndarus* var. *dromus*; *Satyrus circe* (Vernet), *S. hermione*, *S. alcyone*, *S. briseis*,* *S. semele*, *S. arethusa*, *S. dryas* (Biarritz), *Pararge egeria*, *P. megera*, *P. mæra* and var. *adrasta*, *Aphantopus hyperanthus*, *Epinephele jurtina* and (Vernet) var. *hispulla*, *E. lycaon* (Cauterets), *E. tithonus* (omitted from M. Rondou's catalogue, doubtless by an oversight, as it is common everywhere), *Cænonympha ædippus*, *C. arcania*, *C. pamphilus* and var. *lyllus*.

LYCENIDÆ.—*Lætopis roboris* (Vernet), *Thecla ilicis* and var. *æsculi* (Vernet), *T. acaciæ* (Vernet), *Chrysophanus virgaureæ*, *C. hippothoë*, *C. alciphron* var. *gordius* (Vernet), *C. phlæas* and var. *eleus*, *C. dorilis*, *C. subalpina* (Cauterets), *Lampides boeticus*, *Lycæna argiades*, *L. argyrognomon* (*argus auctorum*), *L. baton* (Gavarnie), *L. orbitulus* (Col de Puymorens), and var. *oberthuri*, Stgr.,† *L. pyrenaica*† (Gavarnie), *L. astrarche*, *L. eros* (Cauterets), *L. amandus*, *L. hylas*, *L. escheri*, *L. bellargus*, *L. corydon*, *L. minimus*, *L. semiargus*, *L.alcon** (Biarritz), *L. arion*, *Cyaniris argiolus*.

HESPERIIDÆ.—*Heteropterus morpheus* (Biarritz), *Adopœa lineola*, *A. thaumas*, *Augiades comma*, *A. sylvanus*, *Carcharodus lavateræ*, *C. alcææ*, *C. althææ*, *Hesperia carthami*, *H. sao*, *H. alveus* and var. *fritillum*, *Thanaos tages* (Biarritz).

The following forty-nine complete the species included in M. Rondou's catalogue:—*Papilio alexanor**, reported from Bayonne—probably an imported or escaped bred specimen, as it has not been observed south-west of the Rhone Valley so far as I can discover; *Parnassius mnemosyne*; *Euchloë belia*, with vars. *ausonia* and *simplonia*; *E. tagis* var. *bellezina*, very

* Single specimens only.

† Not reported from the Alps of Central Europe.

doubtful; *Colias palæno*, even more so; *Apatura iris*; *A. ilia*, with ab. *clytie* and ab. *metis*; *Limenitis sibylla*; *Melitæa aurinia*, with vars. *provincialis* and *merope*; *M. cinxia*; *Argynnis hecate*; *A. pandora*; *Melanargia syllius*; *Erebia manto* and var. *cæcilia*, Hb.; *E. oeme*, with vars. *cæcilia*, Esp., and *spodia*; *E. glacialis* var. *alecto*, Hb.; *E. pronœ*; *E. neoridas* and ab. *margarita*, Oberth.* (ranked as a species); *E. æthiops*; *Satyrus statilinus* and var. *allionia*; *S. fidia* ab. *monticola*, Th. Mieg.; *S. actæa* and var. *podarce*; *S. cordula* (ranked as a var. of *actæa*); *Pararge hiera*; *P. achine*; *Epinephele ida*; *E. pasiphaë*; *Cænonympha iphis*; *C. dorus*; *Libythea celtis*; *Nemeobius lucina*; *Thecla spini*; *T. w-album*; *T. pruni*; *Callophrys rubi*; *Zephyrus quercus*; *Z. betulæ*; *Lampides telicanus*; *Lycæna argus*; *L. orion*; *L. eumedon*; *L. damon*; *L. cyllarus*; *L. melanops*; *Pamphila palæmon*; *Adopæa actæon*; *Hesperia proto*; *H. serratulæ*; *H. cacaliæ*; and *H. malvæ*; to which must now be added *Lycæna zephyrus* var. *lycidas*.

PHALONIA (ARGYROLEPIA) BADIANA, Hb.

By EUSTACE R. BANKES, M.A., F.E.S.

DR. T. A. CHAPMAN'S note (*ante*, p. 213) under the above heading, in which he says that he has recently bred this species from seed-heads of burdock (*Arctium lappa*), revives one's scepticism as to the accuracy of the statement published in Wilkinson's 'British Tortrices,' p. 292 (1859), copied into Stainton's 'Manual,' ii. p. 270 (1859), and recopied into Meyrick's 'Handbook,' p. 548 (1898), that the larva feeds in the "stems and roots" of *Arctium lappa* (burdock). The late Mr. W. P. Weston's statement in Entom. xiii. p. 295 (1880), that the larva feeds "in the roots" of *A. lappa*, is, I imagine, derived from the same source, in which case Wilkinson must be held primarily responsible for the widespread belief in the reputed larval habit in question, which has, so far as we are aware, received no confirmation during the last forty-six years. Snellen, in 'De Vlinders van Nederland,' Micro-Lepidoptera, p. 246 (1882), merely says of the larva, "According to Stainton it lives in the stems and roots of *Arctium lappa*," and remarks that it is "still undescribed"; but four years later Sorhagen supplied the omission by publishing a detailed description of the larva in 'Die Kleinschmetterlinge der Mark Brandenburg,' p. 86 (1886).

In opposition to Wilkinson's account of the larval habits we have, in addition to Dr. Chapman's recent experience, the following facts, recorded by some of our most careful and reliable observers. In Entom. xix. p. 295 (1886), Mr. Alfred Thurnall,

* Single specimens only.

in his 'Notes on Micro-Lepidoptera,' says: "*A. badiana*, larvæ in seed-heads of burdock beginning of October, with *lappella*. I fancy the books are wrong in saying that this larva feeds in the stems and roots of burdock. I can only find them in the seed-heads; perhaps they gnaw into the roots or stems for the purpose of pupating." Mr. W. G. Sheldon also, in Entom. xx. p. 33 (1887), remarks: "*Argyrolepia badiana*: what I presume to be the larva of this species was very common in the seed-heads of burdock (*Arctium lappa*) during September. In common with many another entomologist, I have searched long and diligently in the roots and stem for this larva (following the advice of the standard works on the subject), with, of course, no success"; to which the late Mr. W. Machin replied, on pp. 110-1: "I beg to say there are two species of larvæ, viz., *A. badiana* and *Parasia lappella*, feeding in September in the seed-heads of burdock (*Arctium lappa*), both of which I have bred in some numbers for many years past. The larvæ of *A. badiana*, when full fed, leave the heads and spin their cocoons amongst the rubbish at the roots of the plant. . . ." Again, Sorhagen (*loc. cit.*) says of this species: "The larva on *Arctium Lappa*, in the stems and roots (Stainton), or seed-heads (Maling*). I found it in September not infrequently in a meadow near a wood, in the seed-heads of *Cirsium oleraceum*, on the seeds of which Rössler had already guessed that it lived. The frass remains in the domicile. It is full fed before winter, and pupates in spring in its domicile." In Tutt's 'Practical Hints,' part i. pp. 83-4 (1901), we read, "The seed-heads of burdock (*Arctium lappa*) should be collected in September for the larvæ of *Argyrolepia badiana*, which pupate among rubbish at the roots of the plant"; this hint being doubtless based on Mr. Machin's note, which is quoted above. Lastly, in 'Nat. Hist. Trans. Northumberland, Durham, and Newcastle-upon-Tyne,' xv. pt. i. p. 101 (1905), Mr. John E. Robson remarks of *A. badiana*, ". . . among burdock, on which the larva feeds. Meyrick says in the stems and roots; Mr. Gardner says in the seeds. I believe it really feeds on the seeds, but pupates near the roots."

A careful review and comparison of all the above evidence, which proves conclusively that the normal habit of the larva of *A. badiana* is to feed in the seed-heads of *Arctium lappa* (in Britain), or of *Cirsium oleraceum* (in Germany), and to pupate either amongst the rubbish at the roots of the food-plant (Machin), or else in its domicile in the seed-heads (Sorhagen), seem strongly to warrant the assumption that the old idea of its feeding in the "stems and roots" is a fallacy, which probably originated in its habit, observed by Machin, of spinning up near the roots;

* Having failed to find or to trace through friends in the North of England, where Maling lived, the note by him to which Sorhagen alludes, I should be grateful if any one could give me the reference to it.—E. R. B.

for it seems impossible to believe that, in the case of this single-brooded species, the larva, which is indisputably addicted to the former method of feeding, would also adopt the latter.

Isle of Wight: September 25th, 1905.

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND VERNET-LES-BAINS.

By R. S. STANDEN, F.L.S., F.E.S.

(Continued from p. 254.)

VERNET-LES-BAINS, PYRÉNÉES ORIENTALES.

On June 17th we left Barcelona for Vernet, a tedious journey of twelve hours' duration, including a wait of three hours at the fine old fortified town of Perpignan, the capital of the famous Roussillon country. And here we had another sample of the kind of thunderstorm that is manufactured in the south. The thunder and lightning were accompanied by such torrents of rain that in five minutes the streets were rushing rivers, and the natives, caught unawares, like drowning rats. Happily this storm and the one at Montserrat were the only rains we had during the five weeks we were away.

It was dark when we reached Vernet, and we had seen nothing to prepare us for the enchanting prospect which greeted us the next morning. In front of us lay the public gardens—or park, as it is here called—with spreading lawns of the freshest of untrimmed grass, dotted about with large round beds of roses, and intersected with meandering gravel paths. On one side a mountain torrent tore along in a deeply channelled bed, a small kiosk crowning a huge pyramid of rocks piled up in the centre of it. Throughout the park, and all down one side of it, were grouped tall forest trees, through the openings of which could be seen two glistening sheets of water. Here and there were pretty decorative villas embowered in foliage, and all round the outskirts were some half-dozen large hotels—the Hôtel du Parc, in which we were located, being one of them—a casino, and the grand Etablissement des Bains. Looking across the torrent the grim old town rose up, tier upon tier, dominated by the very ancient Eglise de St. Saturnin, and a still more ancient Roman keep; whilst immediately behind us towered Mont Canigou, 9000 ft.—the highest point of the Eastern Pyrenees.

The Rhopalocera of Vernet and Mont Canigou have been so well described and catalogued by Rondou, Oberthür, Elwes, De Graslin, and others, that there seems nothing left to say

about them. It may be interesting, however, to any who may select the latter half of June for their visit to know exactly what species they may expect to find at that period, and the kind of localities in which they occur.

We thought it best to work the lower elevations first, so we spent two long mornings in the scrubby plantations and low-lying meadows on either side of the road to the Villefranche station.

Our joy over results was not precisely delirious here; we were perhaps rather late for the successful working of these dry stony levels, and the only insect at all common was *Cænonympha arcania*, in the little grassy and shrubby copses on the right-hand side of the road; but neither of the vars. *darwiniana* or *satyrion* occurred. There were a few *Aporia crataegi*, *Melitæa athalia*, one or two commoner blues, a *Melanargia lachesis*, and a single very fine female *Læosopsis roboris*.

The next morning we pursued a winding path through the shrubberies leading from the eastern corner of the hotel, which brought us in five minutes to an open sandy tract sparsely covered with *Cistus*, *Lavandula stoechas*, and several coarse grasses. A conduit, which brought water down to the hotels, had in places overflowed, and made damp patches on the sand. Here the lovely *Papilio* var. *feisthamelii* came to take her morning dip. Anything more dainty, more fascinating, than the evolutions in the air of this graceful creature before settling down on the wet sand it is difficult to imagine; and so shy that, if the first swoop of the net failed, she never came again, and I am not sure that I have not more than once rejoiced at her escape. How different was the bold, dashing *P. machaon*! Jones declares that he might have put his net over half a dozen at one time. Here, too, were *Melitæa phæbe* and *athalia*, *Pararge ægeria*, *Epinephele jurtina* var. *hispulla*, and several blues.

A little farther on, by a shady path under trees, we came to a pretty little flower and vegetable garden in a semicircular *cul-de-sac*, hemmed in by a steep and lofty bank held together by great boulders interspersed with young ash-trees, brambles, and other shrubs, and the dainty little pitcher-plant (*Aristolochia pistalochia*). This latter suggested *Thais rumina* var. *medesicaste*, and, although we were too late for the imago, two or three larvæ were found nearly full-fed.

The morning sun sent his hottest rays down into this little corner, and it required some courage to face it; yet, so keen was my companion, that he would stand by the hour against a burning rock high up the bank, in the full glare of the sun, swooping up *Læosopsis roboris*, which seemed to spring at frequent intervals from under his feet, whilst I stood below in the shade, picking up the crumbs, so to speak, that fell from his generous table.

Another notable capture was the Canigou form of *Melanargia lachesis*, which occurred in some numbers before we left.

In the garden was a row of beds that had just been sown with seed, and, after the gardener had given them their morning deluge, it was a pretty sight to see swarms of blues and skippers settle there and revel in the moisture.

By the middle of the day the sun had left this hot corner, and after *déjeuner* we generally crossed the river, and wandered along the road to Castell, where butterflies seemed more plentiful than elsewhere. In this respect it reminded me of that wonderful valley of the Ormonts in Switzerland, between Aigle and Le Sefrey, only that the species were almost entirely different.

About a mile from Vernet was another hot corner—a hollow bend of the road, sheltered from any slight breeze that might be stirring, and this seemed to be the rendezvous of all the butterflies in the neighbourhood. Commonest of all was *Aporia crategi*, and after that *Euchloë euphenoides* and *Melitæa athalia*; then came *Leptidia sinapis*, *Colias edusa*, *Gonepteryx rhamni*, *Limenitis camilla*, *Polygonia c-album*, *Melitæa didyma*, *Argynnis lathonia*, *Pararge ægeria* and *megea*, *Aphantopus hyperanthus*, *Epinephele jurtina* var. *hispulla*, *Cœnonympha arcania* and *pamphilus*, *Lycena argus*, *astrarche*, *icarus*, *escheri*, and *bellargus*, *Argiades sylvanus*, *Hesperia carthami*, and a crowd of others. A little nearer Vernet, on the same road, I took two perfect specimens of the beautiful *Pararge mæra* var. *adusta*. The type is not found in the Eastern Pyrenees.

But, seductive as this locality was, we felt the need of going farther afield, if we were to do any sort of justice to the district. And so, when the demeanour of the amiable Treasurer of the E. S. L. indicated that he was absorbed in the solution of a problem, I knew instinctively that Mont Canigou was the subject of it. A few suggestions on my part added fuel to the flame; a companion was found in a young Englishman staying at the hotel, and on the following morning they were off, taking with them the necessary sleeping-gear for spending the night at a comfortable chalet not far from the peak. After a wholesome night's rest they made an early start for the summit, and, when they had sufficiently recovered from the labour of discharging superlatives at the incomparable panorama that lay before them, Jones unfurled his "engin de chasse," and they commenced the descent. At first there was an immense and rugged moraine intersected by broad streaks of snow—no trees and no shrubs—only a few herbs and lichens clinging to the rocks; also some small ponds. When the trees did appear they were knotted and twisted into the most extraordinary shapes, testifying to the terrible struggles they must have had to sustain against the tempests. Jones was rather surprised to take *Euchloë cardamines* at 7000 ft., and *Argynnis euphrosyne* at 6000 ft.;

then two female *Parnassius mnemosyne* at 4000 ft., and *Erebia stygne* var. *pyrenaica* in great numbers at the same height—a striking form, larger than the type, and with the red band very pronounced. *Erebia melas*—the chief rarity of Mont Canigou—had not yet put in an appearance.

(To be concluded.)

NOTES AND OBSERVATIONS.

ON LATE BROODS OF LEPIDOPTERA.—Nine larvæ of *Notodonta ziczac* pupated on July 1st and 2nd. I allowed them all to spin up in a large chip box. On opening this, on August 1st, I found that an imago had emerged from each of the pupæ and the moths were dead, seeming to indicate that they could not have spent much more than three weeks in pupa. Mr. Grellet, of this town, tells me that he took a specimen of *Plusia moneta* at a gas lamp, on or about Sept. 29th; surely a second emergence. I have now eleven lively and healthy pupæ of *Vanessa urtica*, the result of pupation on Sept. 12th and 13th of larvæ taken about Sept. 3rd. These pupæ are quite lively, and at the present date (Oct. 21st) show no signs of emergence.—A. H. FOSTER; Hitchin.

[*N. ziczac* is normally double-brooded, and *P. moneta* is more or less partially so. During the last week in August of this year I noted a colony of the larvæ of *V. urtica* on nettle at Harpenden, Hertfordshire. They were then about half grown, and about fifty were taken, and these were subsequently reared on hop (*Humulus*). The majority duly pupated, and the butterflies, all but one, emerged between Sept. 17th and 25th. The belated one left the chrysalis on October 23rd.—R. S.]

CAMPODEA STAPHYLINUS.—In September I found, in a garden in Warwick, a specimen of this simple insect, belonging to the *Thysanura*. It may, or may not, be the nearest representative of the primitive insect, but at any rate records of its distribution are none too numerous, and should be made when possible.—W. J. LUCAS.

PREPONDERANCE OF FEMALES IN AUTUMNAL BROODS.—On August 18th last I found at Stoke Dry, in Rutland, a nest of young *Vanessa urtica* larvæ, evidently only just hatched. They began to pupate on September 10th, and emerged from the 1st to the 4th of October. They are twenty in number, and every one is a female. Last autumn (1904) a somewhat similar thing happened with regard to one of the broods of *Abraxas grossulariata* I was rearing. Of forty-two specimens which emerged in October, forty were females. The rest of the larvæ hibernated and produced twelve males and eight females in May and June, 1905.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, October 5th, 1905.

NOTODONTA DROMEDARIUS (SECOND BROOD) AT READING.—On July 15th I found a larva of the above; it spun up among the leaves of birch on the 20th, and emerged a perfect male specimen on August 1.—W. E. BUTLER; Reading.

PLUSIA MONETA (SECOND BROOD) AT READING.—On June 8th I found in my garden one larva of the above; it spun up on the 13th and emerged July 6th, and I netted a worn specimen on the 16th. On August 13th I found one larva and five cocoons, from which I reared five perfect specimens. They emerged—August 27th, two; 28th, one; 30th, one; and September 2nd, one. The larva I found on the same day, August 13th, spun on the side of a glass, and as I was going away for my holidays I very carefully removed it, so that I could take it with me. In the operation, however, I, no doubt, injured it, for that was the only one that did not attain the perfect state.—W. E. BUTLER; Hayling House, Reading, October 16th, 1905.

SECOND BROODS OF LEPIDOPTERA.—I may mention that on August 18th last I netted three perfectly fresh *Ancylis (Phoxopteryx) derasana*. I am aware that this pretty species is occasionally double-brooded, but I had only met with it on one previous occasion. On Sept. 19th last I took two perfect specimens of *Gypsonoma (Hedya) aceriana* on a fence in South Croydon; it is possible that these may have been a partial second brood, but I have never known it to occur with this species or its near allies. I first noticed the imago on July 1st last, and, as usual, it kept coming out all through that month into early August; but then it disappeared, to crop up again on the above-mentioned exceptionally late date!—A. THURNALL; Thornton Heath, Oct. 4th.

[Since the above was written I, yesterday (Oct. 9th), boxed a perfectly fresh *G. aceriana*, and saw two others (unfortunately out of reach) apparently equally fine.]

EPIBLEMA (PHLEODES) IMMUNDANA F.R.—I wish to record a fact to which I can find no allusion in any work on the Tortrices. Collectors of these insects will remember that on the dorsal margin of the above-named species there is always to be traced a more or less conspicuous blotch of a brownish colour in the first brood, but often (in, say, forty per cent.) of the second brood this blotch is nearly or quite pure white. I have never observed this in any specimens of the first brood. What can be the reason for this difference? I first met with this white-patched form as far back as September, 1890, and wondered at the time what it could be. This year I saw dozens of the ordinary form in April and May, and in August a large number of their descendants with the white blotch, although others could not be told from the normally marked first brood.—A. THURNALL; Thornton Heath, October 4th, 1905.

EARLY HYBERNATION OF VANESSA URTICÆ.—On August 23rd I noticed a specimen of *V. urticæ* on the ceiling of a cellar stairway in my house. To-day (October 16th) I see it is still there, and seemingly has not moved since I first noticed it.—T. BAXTER; St. Anne's-on-Sea.

A RAID BY NABIS LIMBATUS.—On September 13th, while we were resting in some fields near Theydon Bois, Essex, we were much interested in watching a struggle taking place in a hedge between a hemipterous insect and a crane-fly. The bug had seized the fly by its left wing, and was striving, in a determined manner, to drag its prey away. The fly offered a stout but bootless resistance, in the course of

which it got badly damaged by clinging to the blades of grass, &c., over which it was being slowly drawn. We brought away both captor and prisoner, and subsequent investigation determined the bug to be *Nabis limbatus* and the crane-fly to be *Tipula paludosa*.—F. W. & H. CAMPION; 33, Maude Terrace, Walthamstow.

RHOPALOCERA PALÆARCTICA.—We have received a prospectus, with specimen plate and page of text, of an important work which is in course of publication, and of which Mr. Roger Verity is the author. It is proposed to bring together information from all sources concerning each species. The "intention is not only to render the work useful to the amateur for the classification of his specimens, but to give it a really scientific value by an exhaustive study of all the geographical, seasonal, and accidental forms of each species." The plate, which is well produced, is of large size, showing thirteen full-sized figures of *Papilio machaon* and its forms. This appears to be a work that is much needed.

CAPTURES AND FIELD REPORTS.

NOCTUA AT HARTLEPOOL.—On Oct. 3rd I took a perfect specimen of *Dasypolia templi* (male) at rest on an electric light standard in West Hartlepool. This, I believe, is the first record of this insect in the town, and, as far as I can ascertain, only the larva has been found in the neighbourhood. The installation of the electric light is drawing new visitors into the town, and in addition to the above I have taken *Nonagria lutea* and *Tapinostola elymi* in the main thoroughfare of Hartlepool.—(Rev.) B. HARVEY-JELLIE; Hartlepool.

INSECTS AT HURST CASTLE. — Hurst Castle is a small peninsula of shingle at the extremity of a single bank of some mile in length. Insects—at any rate conspicuous ones—were, as might be expected, not common there; but on two short visits during August there were seen—the grasshopper, *Stenobothrus bicolor*, male and female; *Vanessa cardui*; *Satyrus semele*; *Pieris rapæ*; *Cænonympha pamphilus*; some blues, no doubt *Lycæna icarus*; a moth, *Eubolia bipunctaria*; a few humble-bees; and a nest of the ant, *Lasius niger*.—W. J. LUCAS.

WASP WITH BUTTERFLY.—On Aug. 13th, in the New Forest, I found a worker wasp of the species *Vespa vulgaris* struggling on the ground with a butterfly, *Pararge egeria*, of which it appeared to be trying to get a good hold. I secured the two. In the glass-bottomed box the wasp snipped off the wings of the butterfly, and then tried to fly away with the body. A few days previously I had noticed a wasp similarly in possession of a moth.—W. J. LUCAS.

LIMENITIS SIBYLLA. — Mr. E. Marsh tells me that he found this butterfly in numbers between Redford and Petersfield in mid-July.—W. J. LUCAS.

PARARGE MEGÆRA. — In and near the New Forest during August this butterfly was rather common. It does not seem usually to be a tiful butterfly in the district.—W. J. LUCAS.

LOCUSTA VIRIDISSIMA. — Mr. G. B. Oliver sends for identification a specimen of this large grasshopper, taken by a labourer in a field at Ramsey, in Huntingdonshire, on Oct. 3rd. As Mr. Oliver had not previously seen one, it is apparently not common there.—W. J. LUCAS.

MUTILLA EUROPEA. — On Aug. 15th I took in the New Forest a specimen of this interesting and brightly coloured solitary ant. It is either uncommon there or it keeps well out of sight, for I have never previously captured a specimen.—W. J. LUCAS.

ACHERONTIA ATROPOS ON THE LANCASHIRE COAST. — A fine male specimen of *A. atropos* was found here on Sept. 10th. Another was taken by a fisherman some time during the same week, but he afterwards lost it.—T. BAXTER; St. Anne's-on-Sea.

VANESSA ANTIOPA IN SUFFOLK. — An example of this species was captured here on Sept. 29th by Mr. R. Rix in his garden, where it had settled on top of a beehive. The specimen, which he has generously given to me, is unfortunately somewhat damaged. About thirty years ago my brother put his hat over one, not far from the present scene of capture, but failed to secure it.—(Rev.) A. P. WALLER; Waldringfield Rectory, Woodbridge.

VANESSA ANTIOPA IN MIDDLESEX. — A specimen of *V. antiopa* was captured at Harrow on July 27th last, and recorded in the 'Field' of Aug. 5th by Mr. A. Vassall, M.A.—F. W. F.

VANESSA ANTIOPA IN NORFOLK. — Mr. Gerard Gurney records in the 'Field' capturing a good specimen of *V. antiopa* on Aug. 26th at Norwich; it was resting with expanded wings on a small oak tree, one of a row which had been "sugared" the previous night. He also states the larvæ of *antiopa* were plentiful last July in the Rhone Valley on various species of willow, in some cases completely denuding the bushes of their leaves.—F. W. F.

CATOCALA FRAXINI IN SUFFOLK. — An example of this fine moth was taken and another seen in September last at Flixton, Suffolk, by Mr. Cecil S. Joy.—F. W. F.

SIREX JUVENCUS IN EDINBURGH. — I received for identification on Oct. 3rd a female specimen of this fine *Sirex*, which was captured in Edinburgh.—F. W. F.

COLIAS EDUSA AT FLEET, HANTS. — Whilst playing on the North Hants Golf Links at Fleet, on July 28th last, I noticed two examples of *Colias edusa*, evidently not long out. I have been in other counties since then—Sussex, Wiltshire, Cornwall—but I have not seen another specimen of this butterfly. — HAROLD HODGE; 9, Highbury Place, London, N.

ÆSCHNA CYANEA. — I bred a very fine *Æschna cyanea* in July this year from a nymph sent to me from Oxfordshire in May (or June) of 1904. This is not the first time I have bred from a nymph kept during the whole winter; but I find the great majority, even though quite small when first obtained, emerge the first summer. — HAROLD HODGE.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 5th, 1905.—Mr. F. Merrifield in the chair.—Mr. J. R. Davidson, of Drumsheugh Gardens, Edinburgh, was elected a Fellow of the Society.—The decease was announced of Mr. John William Douglas, the oldest Fellow of the Society, who was elected in 1845; Mr. George Bowdler Buckton, and Mr. Ambrose Quail.—The President announced that since the last meeting the University of Oxford had conferred upon Commander J. J. Walker, R.N., one of the Secretaries, the degree of M.A. *honoris causa* for services to entomological science.—Mr. Edward Harris showed living larvæ of *Cordylomera suturalis*, taken from a log of mahogany imported from the Sekondi district of the Gold Coast, together with the perfect insect, which was dead at the time the discovery was made.—Mr. A. T. Rose exhibited a remarkable melanic specimen of *Catocala nupta*, taken by Mr. Lewis in his garden at Hornsey, N., in September. The coloration of the lower wings was of a dull brown, and all the markings of the upper wings strongly intensified.—Mr. Norman H. Joy brought for exhibition Coleoptera taken during a three days' trip to Lundy Island in August, including *Melanophthalma distinguenda*, Cox, a species new to Britain; *Stenus ossium* var. *insularis*, a variety new to science; and a series of *Psylliodes luridipennis*, Kuts., and *Ceuthorrhynchus contractus* var. *pallipes*, Crotch, a form peculiar to the island. Mr. Alfred Sich showed examples of *Argyresthia illuminatella*, Z., two of the four specimens taken near Hailsham, Sussex, on June 15th this year. They were beaten off *Pinus*, and until examined with a lens were supposed to be *Ocnerostoma piniariella*, of which species two were also exhibited for comparison.—Mr. W. J. Lucas exhibited the larva, cocoon, and the subsequent imago of an "ant-lion," *Myrmeleo formicarius*, from two Spanish larvæ given him by Dr. T. A. Chapman last autumn. The difference in size between the small larva and the large perfect insect was remarkable. He also showed a living female of the rather scarce grasshopper *Stenobothrus rufipes*, taken in the New Forest at the end of August, and kept alive feeding on grass.—Mr. G. O. Champion exhibited several examples of *Lymexylon navale*, L., from the New Forest.—Mr. A. H. Jones showed series of *Lycæna argus* var. *hypochiona* (*ægon*, Schiff.), taken on the North Downs this year, approaching the form of *L. argyrognomon*, taken not uncommonly in the Rhone Valley. Together with these he had arranged for comparison typical British *L. argus*, L., *L. var. corsica*, from Tattone, Corsica, and a series of *L. argyrognomon*, Brgrstr. (*argus*, auctorum) from Chippis, near Sierre.—Colonel J. W. Yerbury exhibited specimens of *Hammerschmidtia ferruginea*, Fln., the first authentic British specimens, from Nethy Bridge; *Micrododon latifrons*, Lw., wrongly identified at a previous meeting as *M. devius*, and under this name so recorded in Verrall's 'British Flies'; *Chamasyophus scavoides*, Fln., a single specimen swept on June 15th, 1905, in the Abernethy Forest, near Forest Lodge; and *Cynorrhina fallax*, L., which insect occurred in some numbers at Nethy Bridge during the same month.—Mr. H. J. Turner exhibited series of four species of the genus *Coleophora*, *C. alcyoniennella*, *C. lixella*, *C. albitarsella*, and *C. badiipennella*, together with

the larval cases mounted *in situ* on the ruined leaves of their respective food-plants. He also exhibited living larvæ and their cases, of *Goniadoma limoniella* on *Statice limonium*, *Coleophora obtusella* on *Juncus maritimus*, and *C. glaucicolella* (?) on *Juncus glaucus*, which three species he had received from Mr. Eustace R. Bankes, who obtained them in the Isle of Wight.—Commander J. J. Walker read a paper by Mr. A. M. Lea, entitled "The Blind Coleoptera of Australia and Tasmania," and exhibited specimens of *Illaphanus stephensi*, MacL., from Watson's Bay, Sydney, N.S.W., and *Phycotus graniceps*, Brown, and *P. sulcipennis*, Lea, from Hobart, Tasmania.—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Thursday, August 24th, 1905.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. Carr exhibited *Triæna (Acronycta) tridens*, female, from Clandon, with larvæ and bred specimens of *T. psi*.—Mr. Harris, a short series of *Phorodesma smaragdaria*, bred from Essex larvæ.—Mr. Main, a large exotic longicorn beetle, taken alive at Silvertown.—Mr. West (Greenwich), ordinary undeveloped forms and developed forms of the hemipteron *Nabis brevipennis*, from Darent.

Thursday, September 14th.—The President in the chair.—The President referred in suitable terms to the death of Mr. N. D. Warne, for years an active member of the Society.—Mr. South exhibited (1) a long series of *Acidalia virgularia (incanaria)*, and remarked that the specimens, which were bred in April, were all very large, and much darker than usual. From ova deposited by some of the females another generation was reared in July, but the individuals of this brood were small and of the usual colour; in size they agreed with the autumn female parent of the April specimens; (2) *Rhacodia emargana*, with var. *caudana*, var. *effractana*, and var. *excavana*; and (3) a bred series of large and strongly marked *Coremia unidentaria*.—Mr. Goulton, excellent photographs of lepidopterous larvæ.—Mr. Smallman, a beautiful xanthic variety of *Cænonympha pamphilus*, taken on Wimbledon Common in August.—Mr. Kaye, for Mr. Richards (1), series of *Acidalia dilutaria*, one of normal forms, the other of darker and yellower specimens; (2) *Macaria liturata* var. *nigrofulvata*; and (3) pupæ of *Anarta myrtilli*.—Mr. West (Greenwich), a large collection of butterflies from West Africa.—Mr. Main, a photograph of a larva of *Phorodesma smaragdaria*.—Mr. Sich, larvæ and cases of *Coleophora laripennella* on *Chenopodium*.—Mr. South, larva and case of *C. limosipennella* from birch at Oxshott.—Mr. Penn Gaskell, ova clusters of *Ocneria dispar* from San Sebastian, where they were abundant in early September.—Dr. Chapman, examples of *Erebia scipio* from the Basses-Alpes, and the white glistening cocoons of the coccid *Eriopeltis festuca*, and contributed notes.

September 28th.—Mr. Hugh Main, B.Sc., President, in the chair.—Mr. F. M. B. Carr exhibited a variety of *Aglais urticae* taken at Chalfont Road, in which the blue marginal spots are absent, and the black basal area is more extended than usual.—Mr. Moore, the insects taken by him during the Society's field-meeting at Clandon, on July 15th.—Messrs. Harrison and Main, (1) *Apatura iris*, bred from a New Forest larva hibernated on sallow in a sleeve; (2) *Cænonympha typhon (davus)*

from Cheshire and the Isle of Lewis, the former showing the ocelli much more pronounced; and (3) *Erebia athiops (blandina)*, two specimens bred from ova laid by a Yorkshire female.—Mr. Colthrup, a very fine variety of *Polyommatus corydon*, in which the marginal markings of the hind wings were developed and coalesced into radiating streaks.—Mr. J. W. Kaye, a fine bred series of *Thecla pruni*, from Monkswood larvæ. He pointed out the variable and unstable character of the orange markings of the female.—Mr. Joy, a bred series of *Cyaniris argiolus*, being about half of a brood of which the remainder were going over the winter as pupæ, and gave notes on his method of breeding.—Mr. Turner read a paper entitled "Notes on the Genus *Coleophora*," and illustrated each species mentioned by a life-history showing imago, cases at different stages, position in life, and the leaves showing larval depredations.

October 12th.—The President in the chair.—Mr. Edward Hill, of Dorville Road, Lee, was elected a member.—Mr. Stonell exhibited a number of varieties of British Lepidoptera, including pale *Orthostia suspecta*, pale and dark *Noctua sobrina*, *Tæniocampa gracilis* var. *pallida*, &c.—Mr. Cowham, a fine, richly banded *Dicycla oo*, from Woodford.—Messrs. Harrison & Main, (1) *Nemeophila russula*, a series bred from Delamere Forest ova; and (2) *Callimorpha dominula*, bred, from Deal.—Mr. Sich, the two specimens of *Argyresthia illuminatella* from Hailsham, Sussex, which had been determined by Mr. Meyrick as new to the British fauna.—Mr. Kaye, (1) a pair of black *Boarmia gemmaria (rhomboidaria)*; and (2) a much-suffused *Cleora glabraria* from the New Forest.—Mr. Ashdown, specimens of the local hemipteron *Eysarcoris melanocephalus* taken in Surrey, and the rare *E. aneus* from the New Forest.—Mr. West, the Coleoptera *Sibinia potentillæ*, on *Spergula arvensis*; *S. primita*, on grass; and *Rhinoncus bruchoides*, on *Polygonum*, by sweeping in Darenth Wood in August.—Mr. Joy, a fine variety of *Cupido minima*, having the usual submarginal row of dots on the hind wings elongated into streaks of considerable but varying length.—Mr. West (Ashtead), a photograph showing a cluster of *Mania maura* in a corner of a room, where for years they had been accustomed to assemble.—Mr. F. Noad-Clark, a microscope, fitted with all the ordinary modern appliances, in illustration of his paper.—Mr. R. Adkin, specimens of *Emmelesia unifasciata* that had emerged in August of this year from pupæ of 1900. Some individuals had emerged in 1901, 1902, 1903, and 1904, and a few pupæ still remained over.—Mr. F. Noad-Clark read a paper, "Practical Hints in Microscopical Manipulation."—H. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The first meeting of the autumn session was held in the Royal Institution, Liverpool, on Monday, October 16th, the President, Mr. Samuel J. Capper, F.E.S., in the chair, and was probably the largest and most successful in the history of the Society. In opening, the Chairman extended a cordial welcome to the visitors, who included a number of ladies.—After the passing of the minutes, a vote of condolence was passed with the relatives of the late Mr. William Johnson, one of the original members of the Society.—Eight candidates were proposed for membership, and several donations to the Library and Micro-slide

Cabinet were announced.—The exhibits were extremely numerous, of the highest merit and interest, and covered almost every branch of entomology. The following were particularly noteworthy :—Mr. W. A. Tyerman showed a lovely bred series of *Pyrameis cardui* from Water-ville, Ireland; Mr. F. N. Pierce, series of *Abraxas grossulariata*, with many vars., from Wallasey larvæ; Dr. W. Bell, two cases of beautifully preserved larvæ on their food-plants; Mr. W. Mansbridge, bred series of *Peronea permutana*, *P. aspersana*, and *P. hastiana* from Wallasey, *Catoptria expallidana* (Wallasey), *Pædisca corticana*, part of a long and variable series (Delamere), and *Ephippiphora populana* (Crosby); Mr. C. E. Stott, a light var. of *Dicranura vinula* bred from a batch of Blackpool ova; Mr. Richard Wilding, a series of *Polia chi* from Montgomeryshire; Mr. C. F. Johnson, some very dark vars. of *Macaria liturata* (Delamere), one black and one asymmetrical var. of *A. grossulariata* from Stockport larvæ, bred series of *Acronycta leporina*, including very dark suffused specimens (Rixton Moss), and of *Boarmia repandata* and *Acidalia contiguaria* (N. Wales); Mr. G. L. Cox, captures in Hunts, including *Toxocampa pastinum*, *Acidalia rubiginata*, *Dicycla oo*, with var. *renago*, *Hadena atriplicis*, *Cymatophora octogesima*, and *C. or*; Dr. P. F. Tinne, melanic forms of *Aplecta nebulosa*, *A. grossulariata*, *Xylophasia polyodon*, red vars. of *Smerinthus populi*, and specimens of the tarantula spider (British Guiana), and of a *Mygale* which preys on humming-birds; Mr. J. E. Robson, *Synia musculosa*, *Micra parva*, *Leucania extranea*, and *L. vitellina*, all ex coll. Mason, *L. favicolor* (Lieut. Mathew, R.N.), *L. albipuncta* (Bournemouth), *Xylomiges conspicillaris* (Taunton), *Pachetra leucophæa* (G. T. Porritt), and *Anerastia banksiella* (E. R. Bankes); Dr. Cotton, *Zygæna pilosella* and *Cucullia chamomilla* from Abersoch, *Xanthia cerago* and *X. silago* (Eccleston, Lancs.), *Odontopera bidentata* ab. *nigra*, and a very handsomely banded *Noctua festiva* with dark margins; Mr. F. C. Thompson, long series of *Tapinostola fulva*, *Eupithecia venosata* bred from *Lychnis*, and *Miana arcuosa*, all from Eccleston; Dr. P. Edwards, series of *Calligenia miniata*, *Cleora lichenaria*, *Larentia cæsiata*, and *Acidalia imitatoria*, all from South Devon; Mr. R. Tait, jun., bred series of *Angerona prunaria*, *Pericallia syringaria*, and *Eriogaster lanestris* (Monkswood), *Acidalia contiguaria*, and *Agrotis ashworthii* (N. Wales), *Melanippe rivata*, and *M. procellata* (Sidmouth), and a bred var. of *O. potatoria* from Wallasey; Mr. B. H. Crabtree, bred series of *Agrotis ashworthii* and *A. agathina* (N. Wales), *O. bidentata* ab. *nigra*, *A. grossulariata*, and *Dianthæcia cucubali* (Manchester), *Hydrelia unca* (Ulverston), and *Argynnis selene* (Windermere). In Coleoptera, Mr. J. F. Dutton showed a collection made by Mr. Geo. Ellison at Stromness, including a melanic form of *Anchomenus parumpunctatus*, *Donacia discolor*, *Chrysomela sanguinolenta*, *Otiorrhynchus blandus*, *O. maurus*, and *Ptinus tectus*; Dr. H. H. Corbett, *Quedius longicornis*, *Monohammus sutor*, *Orsodacna cerasi*, *Hyperaspis reppensis*, and *Acanthocinus ædilis*, all from Doncaster, and sub-fossil remains of *Hydrophilus piceus* from the peat of Hatfield Moor; a case of Coleoptera collected in the North of France by Messrs. W. G. Dukinfield and C. B. Williams; Mr. H. St. J. K. Donisthorpe, *Dibolia cynoglossi*, *Adrastus pusillus*, and *Dinarda hagensi*; Mr. J. R. le B. Tomlin, *Psylliodes luridipennis* and *Ceutho. contractus* var. *pallipes* from Lundy Island, and *Anophthalmus gentilei*, a blind species from caves in

North Italy.—On behalf of the Liverpool School of Tropical Medicine, Mr. R. Newstead exhibited the life-cycle of the tse-tse fly (*Glossina palpalis*, Rob. Desv.), also living pupæ of this species and of *G. fuscæ*, all from Kasongo (Upper Congo), taken by Drs. Dutton and Todd.—Mr. W. J. Lucas sent a pair of the rare dragon-fly *Ischnura pumilio* from the New Forest.—Mr. Oscar Whittaker, three excellent photographs of cockroaches and a scarce hemipteron, *Aradus depressus*, taken at Pettypool by Dr. C. R. Billups.—Dr. R. J. Cassal sent specimens of a very rare trichopteron, *Limnophilus elegans*, from the Isle of Man.—Mr. E. J. B. Sopp exhibited *Forficula lesnei*, taken on the yellow-horned poppy at Swanage (Tomlin), *F. pubescens*, *Ectobia panzeri*, with egg-capsules, from St. Alban's Head (Tomlin), and a series of life-history cards of British beetles.—J. R. LE B. TOMLIN and E. J. B. SOPP, Hon. Secretaries.

RECENT LITERATURE.

Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. Bulletin No. 1. Parts i.-iv. Leaf-Hoppers and their Natural Enemies. By R. C. L. PERKINS. Honolulu, 1905.

PART I. of this important Bulletin comprises pp 1-69, and deals with species of the Dryinidæ, which are parasitic upon particular groups of Homopterous Rhynchota. Part ii. (pp. 70-85) treats of the Epipyropidæ, a family of Lepidoptera which the author considers most nearly related to *Fumea* and *Taleporia* of the Tineidæ and to the Psychidæ of the Psychina. The larvæ of species referred to this family are parasitic on Homoptera. In part iii. (pp. 86-111, plates i.-iv.) the Stylopidæ (Coleoptera) and in part iv. (pp. 112-157, plates v.-vii.) the Pipunculidæ (Diptera) are considered.

OBITUARY.

With great regret we have to announce that Mr. NORMAN DALZIEL WARNE died on August 25th last, after a short illness. He was born in 1868, and was educated at Charterhouse. Subsequently he went into the well-known publishing business at Chandos House, Bedford Street, of which his father, Mr. Frederick Warne, was the head. On the retirement of the latter in 1895, Mr. N. D. Warne, together with two elder brothers, became partners in the firm. As a student of natural history he was perhaps more especially attached to the Lepidoptera, and most of his somewhat limited leisure was devoted to active work in the field. He was elected a member of the South London Entomological and Natural History Society in 1888, and although he was not able to attend the meetings, during the past two years or so, as frequently as he wished, he always took a keen interest in the welfare of the Society, and was a generous contributor to its library. He was also a member of the Quekett Microscopical Club.

THE ENTOMOLOGIST

VOL. XXXVIII.]

DECEMBER, 1905.

[No. 511.]

AN INTERESTING MELANIC FORM OF *ACRONYCTA* *LEPORINA*.

By WILLIAM MANSBRIDGE, F.E.S.



IN the Liverpool district occasional specimens of a melanic form of *A. leporina* have been captured by various lepidopterists nearly every season for some years past. Attention was first drawn to the variety by my friend Dr. J. Cotton in a paper read before the Lancashire and Cheshire Entomological Society, and at his request I now give these particulars of this interesting form, and propose the varietal name *melanocephala*.

The typical insect occurs everywhere in North Cheshire and
ENTOM.—DECEMBER, 1905.

2 B

South Lancashire where birch is found, but does not seem to be abundant in any of its localities, among which may be mentioned Delamere Forest, the woods near Hale Bank on the Lancashire side of the Mersey, Knowsley Park, and the Mosses between Prescot and Ormskirk; indeed, in some years not more than an odd specimen or two are taken.

What one may regard as the local type is scarcely darker or more irrorated with black than specimens from other parts of England, although now and again one finds an insect with a little more black scaling, yet not enough to form a distinct intermediate between the var. *melanocephala* and the usual form occurring in the district. It is curious that any darkening which may be found is first apparent in the hairs of the thorax, which in the variety are quite black. It is very difficult to estimate the proportion of the variety to the type, which at present is very low, although the ratio seems to be on the increase. Several attempts have been made to obtain ova from this dark form, but without success, so far as I have been able to learn—certainly my own endeavours have failed; and, as the experiment results in the absolute ruin of the moth as a cabinet specimen, one is naturally reluctant to repeat the sacrifice with the one or two insects obtained at the cost of a great deal of hard work.

Acronycta leporina, L., var. *melanocephala*, var. nov.—Differs from the type as follows:—Fore wings in both sexes strikingly suffused with fuscous, and with all the normal markings intensified. Thorax black; abdomen blackish, not so dark as the thorax; hind wings as in the type. Types (male and female) in coll. W. M.

The photograph, here reproduced, is by Mr. Hugh Main, F.E.S. The right side of the upper figure represents the melanic form; the left fore wing should be exactly as dark as the right fore wing, but the camera has failed to show this. The lower figure of a specimen of the usual form is shown for comparison.

ENTOMOLOGY AT BARMOUTH.

By J. ARKLE.

THE railway ride from Chester to Barmouth, in Merionethshire, lies among some of the finest scenery in North Wales. Through the celebrated Vale of Llangollen, and along the side of Bala Lake, the Great Western keeps to the Valley of the Dee. Through the trees, which fringe both river and railway above Llangollen, an occasional glimpse can be had, on the river-reaches, of the Ancient British wicker-made coracle. Still onwards and upwards, and leaving Bala behind, we find the geography books of our youth were wrong in ascribing the source

of that river to Bala Lake. For still there is the Dee, although now reduced to a mere brook splashing and tumbling among the rocks. A sharp look-out must be kept through the carriage-window, or we miss the top of the watershed, and find we are speeding along the banks of another stream which flows in an opposite direction. This is the river Mawddach, and, by the time we reach Dolgelly, it is a respectable stream. The train rushes on to Barmouth Junction, where we change to the Cambrian Railway, and so cross the Mawddach Estuary to Barmouth along the viaduct.

During the last two summers I have had the pleasure of spending a week in July with my friend, Mr. W. J. Kerr, of Tan-y-Bwlch, and now of Cromer, who takes a house at Barmouth for the summer months. Before entering upon an account of the insects observed, it may be well to give some idea of the country which formed our hunting-ground, and which possesses such an attractive insect fauna. (1.) A coast-line of sand-hills (bare) or shingle. (2.) Flat ground, frequently marshy, sometimes cultivated, often meadows. (3.) Belt of rising ground, very rocky, heathery, and woody up to 1500 ft. or so. (4.) Slate or granite mountains with grassy patches frequently 2000 to 3000 ft.; highest point, Cader Idris (the chair of the giant Idris).

A stranger to Barmouth can hardly fail to notice the greetings of numerous jackdaws, the music of the sweet church chimes, and the magnificent flora of the gardens. Here, in a favoured climate, the valerian (so attractive to insects) abounds; veronicas, white and blue, and hydrangeas of chameleon tints, blossom as thickly as hawthorns: they live out of doors all through the winter, and from their size convert the gardens into veritable shrubberies. Tree mallows, eight or nine feet high, and covered with pink blossoms, give an impression as of a foreign land.

Each of my visits was timed for July 15th, and a glance at the floral wealth referred to showed the season of 1905 to be quite a week later than that of the preceding year. And as with flowers, so with insects, as the sequel showed.

I found my friend had been entomologically busy. Among other things on his setting-boards, taken between the 18th of June and July 8th, were a fine series of *Charocampa porcellus*, netted at valerian flowers; a series of *Apamea unanimitis*, also taken at valerian flowers (both species common); three *Cucullia asteris* (only three seen, and all at valerian); a fine series of *Hadena contigua*, taken at sugar; *Mamestra persicariae*, common at sugar; a darkly marked *Noctua festiva*, all wings suffused with smoky, upper wings with central black spots, also black markings; one *Agrotis suffusa*, one *M. furva*, one *Xylophasia scolopacina*, one *N. ditrapezium*, two *Aplecta nebulosa*, one *Mania maura*—all taken at sugar; *A. ripæ*, *Plusia festucae* (one), *Acronycta ligustri*, *Ino*

statices, *Acidalia imitaria*, and several *Thyatira derasa*, captured either at sugar or flowers. This list, omitting other species common and generally distributed, represents entomologically Mr. Kerr's garden. Its application to Barmouth can be increased by adding *Macroglossa stellatarum*, *Bombyx quercus*, *Macrothylacia rubi*, *Malacosoma neustria* (the larvæ feed here on sloe), *Odonestis potatoria* (very common), *Lasiocampa quercifolia* (two larvæ found on sloe, June, 1904; one reared to an imago), *Saturnia pavonia* = *carpini*, *Liparis auriflua* (rather scarce), and *A. tineta* and *A. herbida*, June, 1905.

Two of the above species deserve special mention, *A. nebulosa* and *M. maura*. The type-form of *A. nebulosa* at Barmouth is as pale as *Polia chi*; that is, although only some sixty odd miles south-west from Chester, and practically on the same coast, the moth exhibits no trace of melanism, as in the Delamere varieties *robsoni* and *thompsoni*, but, in fact, inclines towards albinism! Mr. Kerr very kindly gave me one of his specimens. The upper wings are white, the usual markings smoky-grey, with a short black bar near the lower angle; the lower wings are smoky-grey and gradually paler towards the base.

Dusking was much obstructed by the over-abundance of *Hyphenia proboscidalis*, *Scopula lutealis*, *Botys ruralis* = *verticalis*, *Campptogramma bilineata*, and *Crambus culmellus*. Other captures were *S. prunalis*, *S. olivalis*, *Herminia derivalis*, *Rivula sericealis*, *Ebulea sambucalis*, *Nudaria mundana*, *Aphomia sociella*, *C. pinellus*, *Liparis auriflua*, *Miana furuncula* var. *vinctuncula* (Hüb.), *Leucania comma*, *Noctua baja*, *Mamestra brassicæ*, *Habrostola triplasia*, *Plusia gamma*, *P. chrysis*, *Gnophos obscuraria*, *Uropteryx sambucaria*, *Metrocampa margaritaria*, *Crocallis elinguaris*, *Pseudoterpna cytisaria*, *Hemithea strigata* = *thymiaria*, *Boarmia repandata*, *B. rhomboidaria*, *Emmelesia decolorata*, *E. affinitata*, *Acidalia scutulata*, *A. bisetata*, *A. imitaria* (very common), *A. aversata*, *Halia wavaria*, *Cidaria dotata*, *C. ribesaria*, *Eupithecia castigata*, *E. pumilata* (worn), *Abraxas grossulariata*, *A. sylvata* = *ulmata*, *Hysipetes elutata*, *Cabera pusaria*, *Coremia ferrugata*, *Melanthia bicolorata* = *rubiginata*, *M. ocellata*, *M. albicillata*, *Melanippe sociata*, *Larentia viridaria* = *pectinitaria*, *Pterophorus monodactylus*, and *Aciptilia pentadactyla*.

Beating by day gave us *Lithosia lurideola* = *complanula*, *Lomaspilis marginata*, *Eubolia mensuraria*, *C. populata*, *C. truncata* = *russata*, *H. elutata* (very ordinary forms), *E. affinitata*; while *Tanagra atrata* = *chærophyllata*, *Pyrausta purpuralis*, *P. ostrinalis*, and *Ennychia octomaculata* were occasionally netted on the hillsides.

Among other small things taken in the district were *C. hortuellus*, *C. pratellus*, *T. fosterana*, *T. viburnana*, *T. læflingiana* var. *ectypana*, *Cnephasia subjectana*, *Scoparia cembræ* var. *scotica* in 1904; and *T. læflingiana*, *Scoparia frequentella* var. *port-*

landica, *Cnephasia osseana*, *Cacoecia rosana*, and *Salebria betule* in 1905.

Sugaring became unprofitable with the middle of July, and more so in 1904 than in 1905. The following is the list for 1904: *Acronycta rumicis* (common), *Cerigo cytherea*, *Hadena contigua* (one), *Triphaena ianthina*, and *Leucania conigera* (common). In 1905 this list was increased by *T. fimbria*, *T. orbona*, *M. persicariæ* (abundant), *A. rumicis*, *Axylia putris*, *Xylophasia polyodon* (finely marked forms on a pale ground), *H. derivalis*, *Hydræcia nictitans*, *H. oleracea*, *Phlogophora meticulosa*, several *H. contigua* (mostly worn), *Apamea oculatea* (fine mahogany-coloured forms), *Caradrina cubicularis*, *Noctua plecta*, *Amphipyra tragopogonis*, pale *X. lithoxylea*, *M. maura*, and very many *L. conigera*. Towards the end of August sugar again became productive, and among the autumn moths *Asphalia diluta* and almost black *N. xanthographa* should be noted. In the charming grounds of Mr. Davis (Plas Mawddach)—remembered for more than one enjoyable evening with the net in July—several *Sphinx convolvuli* were taken at flowers of *Nicotiana affinis* in September.

In our dusking and sugaring operations we were aided by a powerful lamp, which was carried, even well up the hillsides. Fears were entertained lest it might be mistaken for the religious lights reported in the neighbourhood, but which, not being among the faithful, we had failed to see. However, our brilliant lamp excited, apparently, neither enthusiasm nor comment.

No one who has climbed the Panorama Walk from Barmouth and up to Panorama View can forget the splendid mountain scenery. On the lower slopes *Zygæna filipendulæ* swarmed, and resting on the rocks higher up *A. promutata* could be had. The ground marked No. 1 (sand-hills or shingle) was so barren and unproductive that it received only a single visit. Nothing animate appeared to exist save the restless surf, with its everlasting groan and roar. The ground marked No. 2, however, was alive with insect life. On two spots (one about two miles north of Barmouth, and close to the railway; the other, Arthog Marsh, on the other side of the estuary and opposite the town) are colonies of *Z. trifolii*. This is an interesting insect, because it has been declared, with hardly any reservation, to be the *Anthrocera palustris* of Mr. Tutt (see 'Practical Hints for the Field Lepidopterist,' pp. 68 and 90). Remembering the situations affected by *Z. trifolii*, and the dates quoted, say, by Wilson, for its occurrence (second week in May to second week in June), it certainly seems more than curious if this marsh insect, mostly fresh in the middle of July, should be the same species. Certainly there is nothing in the climate of Barmouth to retard the appearance of *trifolii*. My specimens of this marsh insect are, on the whole, larger than in my series of *trifolii* (Yorks), and the spots, on the whole, are larger. Sometimes the second pairs of

spots are confluent. In 1904 a few *filipendulæ* (there were numbers two or three hundred yards off) were found flying with them, but not in 1905; and the moths were fresher in 1905 than in the more forward July of 1904. The second week in July, however, in any season would, I believe, see the moths at their best. I brought a few live females home with me. They seemed very happy on thistle-flowers in a glass-jar with net over the top, and they laid numbers of yellow eggs underneath the flower-heads, from which I have now hybernating larvæ. Other insects on this Arthog Marsh were *Epinephele hyperanthus* (plentiful), *Argynnis aglaia*, *C. perlellus* (abundant in 1904, none seen in 1905), with its melanic form *warringtonellus* and intermediates, *C. pascuellus* (most plentiful in 1905), *Perinephele lancealis* (one only in 1904), *Endotricha flammealis*, *Stenopteryx hybridalis*, *P. pruniata* = *cytisaria* (worn), *E. plumbaria* = *palumbaria*, *A. immutata* (common), *R. sericealis*, *C. culmellus*, &c. In the reed-beds were larvæ and pupæ of *Nonagria arundinis* = *typhæ*, and earlier in the month *X. scolopacina* had been, in 1904, common at sugar. Typical specimens of *Bryophila perla* were found resting on the walls in the neighbourhood, particularly on the Barmouth side. A nice local strain of this species was discovered away to the north, near Minfford, varying from very pale to darkly-marked forms.

It is a butterfly country. Near the village of Arthog, among the wooded slopes (ground No. 3), *Thecla w-album* was a plentiful insect, but very local, and more abundant and in better condition in 1905 than in 1904. In a favoured open spot, not a dozen yards across—a regular butterfly corner, and full of flowering bramble, scabious, meadow-sweet, knapweed, and St. John's wort—we stood, in the full blaze of a hot sun, and netted the little *Theclas* at our leisure. It was impossible to take too many of them, for they have a wonderful way of dodging the net, particularly on bramble. In 1904 Mr. Kerr headed the score, Mr. T. White (also of Cromer) came second, and I made a bad third. In 1905, however, I did much better; but, as is too often the case with the *Theclas* when netted, most of our captures were either chipped or rubbed. Here, in this butterfly corner, were also *A. paphia* and *A. aglaia*, *Pararge egeria*, *T. quercus*, *Lycena icarus* = *alexis* (worn), *E. hyperanthus* (abundant), and, not far from it, *E. ianira*, *E. tithonus*, with an occasional *Pieris brassicæ* and *P. napi*; the last-mentioned paler than Chester specimens, but often with very primrose-yellow under sides. On the lower grounds throughout the district *P. rapæ* and *Vanessa urticae* were common enough, two or three *V. atalanta* (probably hybernated specimens) were seen, and *Satyrus semele* was plentiful on the sunny embankments of the Cambrian Railway. *Thecla quercus* occurs freely in, apparently, all the oak woods, especially on ground No. 3. In one locality on the Barmouth side of the

estuary Mr. Kerr was our guide to a spot where the butterfly literally swarmed. The best way to capture it is to get on the hillside, as much as possible on a level with the tops of the scrub oaks. After mid-day the butterfly goes to rest, and hardly one is to be seen. Mr. Kerr foretold they would reappear about five o'clock, and there was never truer prophecy. At the appointed time they were on the wing again, more abundant than at mid-day. But, although fresh out, in 1905, like *T. w-album*, few of our captures were perfect. In this locality one or two *Pararge megara* were observed.

And no one who has been there can ever forget the lovely mountain forest scenery of the Artro Valley, eight miles north of Barmouth. On the marshes by the railway on our journey to the valley, *Melitæa aurinia* = *artemis* occurs in the season. The valley practically begins at the village of Llanbedr, and nets were soon in requisition. On the way up a spot was pointed out where *Euchloë cardamines* (generally distributed throughout the neighbourhood), *Nemeobius lucina*, *Nisoniades tages*, and *Macroglossa bombylifformis* can be taken. Higher up the valley, on the marshy patches among bog-myrtle, *A. selene* and *A. euphrosyne* are abundant in their season. I saw and nearly captured a worn specimen of the latter. Both in 1904 and 1905 *A. paphia*, *A. aglaia*, *A. adippe*, *Cænonympha pamphilus*, *Pararge egeria*, and *Hesperia sylvanus* were captured. The fritillaries were so abundant that on one occasion in 1904 I took two *A. aglaia* and one *A. adippe* with one sweep of the net. We saw only one or two *egeria* in 1904, but they appeared to be fine and fresh. In 1905 a good many were seen and netted; but they were all worn, and evidently remnants of the first brood. On a low-lying flat in this valley we again came upon the marsh *trifolii*, and flying with *filipendulæ* in 1904; but, curiously enough, we did not see them together in 1905. Higher up is the fine Nancol Fall. At rest upon a rock near the fall was a rather worn *Hepialus hectus*. The Nancol is a tributary of the river Artro, and the fall struck me as being an almost exact duplicate of the Fairy Glen, Bettws-y-Coed, but with a greater volume of water, and altogether more dangerous.

July is a between-time for larvæ, generally speaking; that is, it is a month between the imagos of most species and the caterpillars. The following larvæ, however, were observed: *Dianthæcia capsicola*, in capsules of *Silene inflata*; *Phalera bucephala*, on oak; *Euchelia jacobææ*, on ragwort flowers; and I counted nine broods of *V. urticæ* one day on roadside nettles close to Barmouth.

The district is evidently a rich one for Diptera. We met a collector who showed us a choice collection taken chiefly on the marshes. On Arthog Marsh the great ox gadfly, *Tabanus bovinus*, was more numerous than welcome. This dipteron can pierce

through the thickest ribbed stocking, and raise pyramidal blisters the size of a crown piece. Another dipteran infests the hind-quarters of cattle, with apparently the instinct to keep well out of reach of the animals' tails.

Dragonflies were numerous. *Sympetrum striolatum* = *Libellula vulgata* was frequently met with in the lower woods; *Orthetrum cærulescens* was generally distributed, abundant flying over a ditch on Arthog Marsh; *Cordulegaster annulatus* often sported, especially over this ditch, in half a dozen at a time, until, when one was caught, the rest made off, and we saw them no more. Here were also numbers of *Libellula depressa*, and more than once late specimens of *Pyrhosoma nymphula* = *Agrion minium* and *Ischnura elegans* were captured. *Calopteryx virgo* was taken, and *Æschna juncea*. The last-named is known as "the snake servant" by the country folk. Whenever you see one, they say, you are sure to see a snake as well. Curiously enough this was more than once verified. But the snake was only a harmless grass snake, and, after the manner of all British serpents, very glad to get away as fast as possible.

Ground No. 4 (the mountain tops) we simply admired over and over again for its indescribable grandeur, so I have no idea what insects, if any, exist thereon.

Chester: Nov. 1st, 1905.

NEUROPTERA COLLECTED BY DR. T. A. CHAPMAN IN FRANCE AND SPAIN, 1904.

By W. J. LUCAS, B.A., F.E.S.

IN 1904 I received from Dr. T. A. Chapman a small collection of Neuroptera taken by him that year in France and Spain. Most of these were dragonflies; but a few belonged to other and more obscure groups of the order Neuroptera as generally understood.

Dr. Chapman supplies the following note on the localities in which the insects were found: "About a month was spent at Hyères (March 20th to April 17th). I believe all of the few dragonflies taken there were met with at La Plage, on the coast, some two or three miles from Hyères—all I think by the ditches beside the racecourse; where the mosquitoes were sufficiently troublesome to make the sport unattractive. The next ten days were spent at Ste. Maxime, some way eastward along the coast. There is no limestone here, and the botany and entomology are in several respects decidedly different from those of Hyères. A few days (May 3rd to 8th) were then spent at Draguignan (some way inland), in a valley basin between quite low hills. It

seemed a promising locality, more like Hyères in its Lepidoptera, with some Basses-Alpes flavour (*L. duponchelii*, &c., being present). All these localities are, however, very well known. In Spain, in July and August, we visited two very different localities, taking on the way a day or two at Guethary (July 5th, 6th), a pleasant little watering-place not far from Biarritz, and with an Atlantic fauna and flora. In Spain our first resting-place (July 8th to 22nd) was at Puerto de Pajares, a pass across the main ridge of the Cantabrian ranges, at 4500 ft. elevation, about two hundred miles west of St. Sebastian and some thirty-five from the Atlantic coast, with a climate and general aspect of country reminiscent of many parts of Scotland,—a humid climate, with bog and moorland, grassy and stony mountains, but passing rapidly on the southern side into a drier and more typically Spanish district. We then went to La Granja (July 24th to August 2nd), and for a day (August 5th) to Navalperal, both in the Guadarrama range, at about 5000 ft. elevation, some thirty or forty miles from Madrid, quite in central Spain, in a region where the lower ground at least is very dry and hot in summer, and the fauna and flora are quite Mediterranean in their aspect, with even a little of the African character that the more southern and eastern portions of Spain possess. The Guadarrama is, however, well watered in its upper levels, and it results that La Granja is one of the richest and most prolific stations in Spain that the entomological collector could desire—quite rivalled, however, by other places in the same range, as, for example, the Escorial. Both La Granja and the Escorial are now becoming familiar to English entomologists. The larvæ of *Myrmeleon* were very abundant in the pine-woods at La Granja, under the trees where the earth was very light and dusty, occasionally six or eight, of very various sizes, being present in about a square foot of ground.”

For the sake of comparison, species that do not belong to the British fauna are marked with an asterisk.

FRANCE : Hyères. — Dragonflies : *Brachytron pratense*, one female ; *Pyrrosoma nymphula*, one female ; **Sympycna fusca*, a considerable number ; *Ischnura elegans*, several.—Ste. Maxime. Other Neuroptera : *Hemerobius lutescens*, one ; *Chrysopa aspersa*, one ; *Mystacides azurea*, two ; **Sericostoma galleatum*, a very interesting form of the genus, two.—Draguignan. Dragonflies : *Libellula depressa*, two females, immature male ; **Gomphus simillimus*, one male ; *Cordulegaster annulatus*, one rather immature female. Other Neuroptera : **Ascalaphus coccajus*, one male ; **Panorpa meridionalis*, one female, the identification of which is just a little doubtful ; *Odontocerum albicorne*, two ; **Rhyacophila vulgaris*, one.—Pont du Gard. Dragonflies : *Brachytron pratense*, one male, one female.—Guethary (Basses-Pyrénées). Dragonflies : *Orthetrum cærulescens*, one male, one female ;

Cordulegaster annulatus, one female; *Calopteryx virgo*, one male, one immature female; **C. hæmeroidalis*, several, both sexes; *Platynemis pennipes*, one female; **P. latipes*, one male, one female.

SPAIN: Puerto de Pajares.—Dragonflies: *Sympetrum striolatum*, one male; *Pyrrhosoma nymphula*, two males, two females. Other Neuroptera: *Sialis fuliginosa*, one; **Panorpa meridionalis*, three males, three females; *Megalomus hirtus*, one, provisionally so named by Mr. Morton, but it does not entirely agree with the northern *hirtus*, nor the big southern form *torticoides*, Rambur; *Limnophilus centralis*, four; **Sericostoma pyrenaicum*, two (perhaps = *S. selysi*).—La Granja. Dragonflies: *Sympetrum striolatum*, two males; **S. meridionalis*, one male; *S. flaveolum*, one male, one female; *Orthetrum cærulescens*, three males, three females; **O. brunneum*, one male; *Cordulegaster annulatus*, one female; *Anax imperator*, one male; *Calopteryx virgo*, one male, two females; *Lestes sponsa*, one female; **Sympycna fusca*, one male, one female. Other Neuroptera: **Myrmeleon formicarius*, one; **Ascalaphus longicornis*, five females; **Dilar meridionalis*, six; *Hemerobius inconspicuus*, one; **Leptocerus braueri*, one.—Navalperal. Dragonfly: **Lestes barbara*, one defective male.

Two living larvæ of the ant-lion (*Myrmeleon formicarius*) from La Granja were given me by Dr. Chapman on September 22nd. After passing several months without food, one produced an imago of good size about the following midsummer.

For great assistance in identification I have to thank Mr. K. J. Morton, of Edinburgh, especially in connection with the specimens belonging to the less known and more difficult groups, which, though few in number in this collection, were none the less interesting.

ON THE DARK FORM OF *ISCHNURA ELEGANS* (FEMALE).

By F. W. AND H. CAMPION.

IN October, 1904, we drew attention in these pages (vol. xxxvii. p. 252) to the occasional occurrence in Epping Forest of a dark form of *Ischnura elegans*, female. We have again met with this form during the present year, specimens having been taken on June 25th, August 13th, and September 3rd, one on each occasion. The second specimen was at the time of capture attached *per collum* to a normal male; this was evidently an old individual, as it had a worn and dusty look, and had the left fore wing torn. The association of this dusty appearance with ragged wings was also noticed on July 22nd in the case of two females of *Agriön puella*. The state of the example of August 13th and a re-

consideration of the arguments in favour of maturity set out in our previous communication have confirmed our impression that we are dealing with a mature form. The species has been unusually abundant with us this year, and we have paid special attention to the immature coloration, with the result that we are satisfied that at no stage of its colour-development does the typical form correspond with the dark form. The fact that the latter has occurred in three successive years encourages the belief that it is also permanent, and to this form we now propose to give the varietal name of *infuscans*.

During the present season, also, the orange variety of the female (*rufescens*, Steph.) has made its appearance in Epping Forest, for the first time in our experience. We have therefore been placed in a position to compare fresh specimens of *rufescens* with our own dark females, and we think that the chief points of difference between the typical female and its two varieties may be stated in the following terms:—

- | | |
|---|-------------------------|
| Spots behind eyes small and rounded; meso- and meta-thorax blue, with a broad black mid-dorsal band, and two narrower black lateral bands; segments 1 and 2 blue, with thistle-shaped black marking on 2; 8 blue. | <i>elegans</i> . |
| Spots behind eyes large and pear-shaped or rounded; meso- and meta-thorax orange, with a broad black mid-dorsal band; lateral bands obsolete; segments 1 and 2 orange, with flask-shaped black marking on 2; 8 blue | <i>var. rufescens</i> . |
| Spots behind eyes small and rounded; meso- and meta-thorax dark olive-green, with a broad black mid-dorsal band; two narrower black lateral bands usually present, but not constant; segments 1 and 2 dark olive-green, with thistle-shaped black marking on 2; 8 dark orange-brown, becoming almost black in time. | <i>var. infuscans</i> . |

RHOPALOCERA AT BARCELONA, MONTSERRAT, AND VERNET-LES-BAINS.

By R. S. STANDEN, F.L.S., F.E.S.

(Concluded from p. 280.)

The climb appears to have been a tolerably fatiguing one, and Jones got badly blistered by the sun while crossing the snow near the summit. I was chagrined nevertheless that my years kept me ignominiously at the bottom.

Our last and most memorable walk was to the ruins of the abbey Church of St. Martin du Canigou, about three and a half miles from Vernet, at a height of 3000 ft. After passing the village of Castell there is a zigzag of nearly two miles over a

wild and rocky pass before reaching the ruins, which burst upon you quite suddenly.

It is an imposing group of eleventh century Roman work in pale grey granite, the tower alone standing erect and uninjured, as though it would brave eternally the tempest and the storm. It stands on a high isolated plateau, from which, on one side, is a splendid view over the smiling Valley of Vernet, and on the other a dark and frightful abyss, the bottom of which is covered with verdure—a singular contrast.

At the further end of the Abbey is an extension of the narrow plateau, well covered with grass and shrubs, alternating with huge blocks of granite, and here the form of *E. stygne*, before mentioned, was excessively abundant. I took rather a singular example of it, in which the band was grey instead of red, and four-eyed spots on the fore wing instead of the customary three; but it can only, I think, be considered a curious colour aberration. *Parnassius apollo* seemed to be coming out quite fast, and it was a pretty sight to see them, together with *feisthamelii* and *machaon*, fluttering about that grandest of Cistuses—the *laurifolius*—many large bushes of which adorned the banks a little lower down. I took here also a fine specimen of *Chrysophanus alciphron* var. *gordius*, and Jones a *Pararge mæra* var. *adrasta*.

Thus ended our brief visit of ten days to one of the most lovely and productive places in the Pyrenees. There is no doubt that from the middle of June to the middle of July would be the most favourable period of the year for working this district, and I believe that a few days spent at the comfortable hostelry on the arête of Mont Canigou during the second week of July, working downwards, would result in a complete mastery of the Erebias of the district.

I append a list of the Rhopalocera taken and observed:—

Papilio podalirius var. *feisthamelii*, Dup. Common, frequenting damp ground and resting on mud. The type also occurs rather earlier in the year.—*P. machaon*, L. Common locally.

Thais rumina var. *medisicaste*, Ill. One worn specimen seen, and larvæ nearly full grown on *Aristolochia pistalochia*.

Parnassius apollo, L. Common about St. Martin du Canigou.—*P. mnemosyne*, L. Two females; 5000 ft., Mont Canigou.

Aporia crategi, L. One of the most abundant butterflies of the district.

Pieris brassicae, L., and *P. rapæ*, L. Scarce.—*P. napi*, L., and *P. daphidice*, L. Occasionally.

Euchloë cardamines, L. One on Mont Canigou at 7000 ft.—*E. euphenoides*, Stgr. Common and fairly fresh.

Leptidia sinapis, L. Occasionally.

Colias hyale, L. Two males in good condition on the Castell road. Rondou gives August only for this species, but there must be a spring brood also, I imagine.—*C. edusa*, F. Occasionally, quite fresh.

Gonepteryx rhamni, L. Several, worn.

- Limenitis camilla*, Schiff. Rather common.
Pyrameis atalanta, L. One seen.—*P. cardui*, L. A few.
Vanessa io, L. Two just out.—*V. polychloros*, L. A few seen.—
V. antiopa, L. One seen.
Polygonia c-album, L. Common.
Melitæa cinxia, L., *M. phæbe*, Knoch, and *M. didyma*, O. A few.—
M. didyma var. *alpina*, Stgr. One only.—*M. athalia*, Rott. Numerous and very variable. It is possible that one or two may prove to be *deione*, and others the var. *vernetensis*.—*M. dictynna*, Esp. A few.
Argynnis euphrosyne, L. One on Mont Canigou at 6000 ft.—*A. lathonia*, L. Several.—*A. adippe*, L. Seen only.
Melanargia lachesis, Hb. A few.—*M. lachesis* var. *canigoulensis*. Fairly common; rather near *galatea* on under side, but ground colour a more chalky white.
Erebia evias, God. One or two, worn.—*E. stygne* var. *pyrenaica*, Rühl. Very abundant on Mont Canigou at 4000 ft., and again at St. Martin du Canigou.
Satyrus alcyone, Schiff., and *S. semele*, L. Occasionally, just coming out.
Pararge ægeria, L., and *P. megera*, L. A few.—*P. mæra* gen. æstid. *adrasta*, Hb. A few; described in Montserrat list. The type does not occur in the Eastern Pyrenees.
Aphantopus hyperantus, L. Common.
Epinephele jurtina var. *hispulla*, Hb. A few; did not see the type, although Rondou and Elwes both give it as abundant.
Cænonympha arcania, L. Very common on Station Road.—*C. pamphilus*, L. A few.
Lacosotis roboris, Esp. Locally among young ash-trees; fairly common, and in beautiful condition.
Thecla ilicis, Esp. A few.—*T. ilicis* ab. *cerri*, Hb., and *T. ilicis* var. *esculi*, Hb. Two or three.
Callophrys rubi, L. One worn specimen, Station Road.
Chrysophanus alciphron var. *gordius*, Sutz. One or two at St. Martin du Canigou.—*C. phlæas*, L. A few.
Lycæna argiades ab. *coretas*, O. One or two females only.—*L. argus*, L. A few. Staudinger (whose nomenclature I have followed) does not recognize *ægon* as distinct.—*L. orion*, Pall. One specimen only.—*L. astrarche*, Bgstr. Common and fine.—*L. icarus*, Rott., *L. amandus*, Schn., *L. escheri*, Hb., *L. bellargus*, Rott., and *L. coridon*, Poda. A few.—*L. cyllarus*, Rott. One only.
Cyaniris argiolus, L. Occasionally.
Adopæa thaumas, Hufn. Two or three.
Argiades sylvanus, Esp. Common.
Carcharodus alceæ, Esp. One only.
Hesperia carthami, Hb. Just coming out, several specimens.—
H. sao, Hb., *H. alveus*, Hb., and *H. malvæ*, L. Occasionally.

Referring to the last paragraph of my paper (*ante*, p. 280), Mr. Rowland-Brown reminds me that it has been conclusively established by Dr. Chapman that *Erebia melas* is not a Pyrenean species at all, but that *lefevrei* is the proper specific name for the Pyrenean form.

NEW AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. COCKERELL.

(Concluded from p. 273.)

The microscopical characters of these species are as follows:

(1.) Front.

H. bicingulatus.—Densely rugoso-punctate.

H. oxleyi.—Densely rugoso-punctate, the punctures large.

H. humei.—Closely rather weakly punctured, with a few short striæ in front of middle ocellus.

H. lanuginosus.—Exceedingly densely punctured, the punctures large; this is like the mesothorax of *oxleyi*.

H. gilesi.—Very densely punctured, the punctures strong but not extremely large.

H. representans.—Very densely punctured.

It will be noted that the front is entirely different from that of the metallic species, described earlier. *H. humei*, which shows signs of striæ, is in other respects most like the metallic species.

(2.) Mesothorax.

H. bicingulatus.—Densely rugoso-punctate, the punctures dull, the areas between them more shining, and minutely ridged or lineolate—the remnants of a tessellate sculpture.

H. oxleyi.—Densely rugoso-punctate, the punctures large, the ridges between them reduced, and not sculptured; the punctures themselves are shiny.

H. humei.—Coarsely microscopically tessellate, with numerous punctures, in the manner of *H. murrayi*.

H. lanuginosus.—With dense large punctures, much as in *oxleyi*, but there are more distinct intervals between them, which, however, are smooth and shining.

H. gilesi.—Densely punctured, the punctures large, the intervals showing coarse tessellate sculpture, in the style of *bicingulatus*.

H. representans.—With dense large punctures, the surface between not sculptured, except anterior middle, which is irregularly transversely lineolate, with only short pliciform hair-punctures.

(3.) Second abdominal segment.

H. bicingulatus.—Shining, but very closely and strongly punctured, the punctures extending over the whole surface.

H. oxleyi.—Extremely finely and densely punctured all over, the punctures very minute and regular, looking like very fine honeycomb.

H. humei.—Basal half closely and distinctly punctured; apical half feebly transversely lineolate, with scattered hair-punctures. (First segment well punctate, though not densely, on apical half; third segment not even well punctate at base.)

H. lanuginosus.—Basal part very densely punctured, not unlike front, but apical part with the punctures well separated though very strong, showing the surface, which is coarsely tessellate, with a tendency for the stronger lines to run transversely.

H. gilesi.—Strongly punctured; very densely basally; about the middle the punctures are well separated, showing the shining ground, which is transversely lineolate, the lineolæ often joining, so that the sculpture becomes subtessellate; the depressed apical part has the punctures smaller, narrowed, each emitting a hair.

H. representans.—Very strongly punctured, the punctures extremely dense on basal third, but otherwise well separated, and more or less transversely elongated, but the surface between is shining and smooth.

The microscopic characters are not repeated in the specific descriptions.

Halictus bicingulatus, Sm.

Melbourne; Ent. Club, 44. 12.

Halictus oxleyi, n. sp.

♂. Length about 7 mm., or rather less; black, with the pubescence yellowish, especially on face, where it is abundant; mandibles rufous, lighter and almost yellow in the middle; scape dark, but the rest of the antennæ light ferruginous, above and below, the flagellum paler and yellower beneath; metathorax truncate, but the margins not sharply angled; enclosure shining and smooth, roughened only at extreme base, abruptly ridged transversely by the upper border of the truncation, but the edge is not sharp; tegulæ large for the genus, very pale testaceous; wings hyaline, nervures and stigma amber-colour; b. n. falling far short of t. m.; femora piceous, with the apex pale ferruginous; tibiæ and tarsi pale ferruginous; abdomen broad, with a sericeous lustre, piceous, with the hind margins of the segments pallid, but no hair-bands or patches,

Hab. Adelaide, 59. 52. Allied to *H. orbatus*, Sm., and *globosus*, Sm.

Halictus humei, n. sp.

♀. Length about $5\frac{1}{2}$ mm.; black, with greyish-white pubescence, quite dull and greyish dorsally, whiter and abundant on the ventral surface of thorax and abdomen; antennæ dark, the flagellum brownish beneath; area of metathorax granular, not invading the truncation, tegulæ rufo-piceous, with a lighter spot; wings hyaline, slightly dusky, very iridescent, stigma and nervures reddish brown; b. n. falling only a little short of t. m.; first r. n. joining second s. m. near its apex; third t. c. and second r. n. very weak; legs piceous, very hairy, the

hair on hind tibiæ above glistening silvery; abdomen broad, shining but quite pubescent, the hind margins of the segments obscurely rufescent; the lateral bases of segments 2 to 4 broadly covered with whitish tomentum.

Hab. "Australia," 67. 42 (type). Another is marked "Australia, 58. 168." This may be compared with *H. globosus*, Sm., and *H. familiaris* (Erichs.). It nearly agrees with the brief description of *H. familiaris*, but does not seem to be quite the same, and it is questionable whether *familiaris* can ever be certainly recognized. The hind spur of the hind tibia in *H. humei* is very peculiar, being simple except for a stout divergent truncate spine or tooth just before its middle. The anterior spur of the same tibia is microscopically ciliate.

Halictus lanuginosus, Sm.

"Australia" (Koebele). In U. S. National Museum.

Halictus gilesi, n. sp.

♀. Length about 8 mm.; black, looking just like *H. repræsentans*, except for the following characters: clypeus with irregular longitudinal furrows as well as punctures; tegulæ redder; mesothorax much more coarsely sculptured; stigma lighter and redder; first r. n. entering apical corner of second s. m.; otherwise scarcely at all different, but clearly a valid species. The microscopic characters, given above, are decisive.

Hab. Victoria, 89. 108.

Halictus repræsentans, Sm.

Hobart, Tasmania (J. J. Walker, 3221, 3222).

Boulder, Colorado: Sept. 23rd, 1905.

BIBLIOGRAPHICAL NOTES ON THE HEMIPTERA.

No. 5.*

By G. W. KIRKALDY.

(A) THE TYPE OF CIMEX, Linné.

I HOPE the readers of the 'Entomologist' are not already bored with this question; the supposed "law," however, that Mr. Blanford considers so conclusive is not an old well-established proposition, or rather—more correctly—an old, effete suggestion originating at the dawn of modern nomenclature, but immediately laid aside because of its impracticability.

Mr. Blanford's note (p. 110) is eminently unsatisfactory. He

* This article was written by Mr. Kirkaldy prior to the death of the late Mr. Blanford, whose note on the subject was published, *ante*, p. 110.—Ed.

has evaded the real points at issue, and merely refers to the former note in 'Nature,' to which I had raised what were, to me at least, valid objections.

As I had not at the time of my receipt of the 'Entomologist' for April a copy of the 12th edition of the 'Systema' (I possess only the 10th and 13th), it was necessary to delay my reply. It now appears, as will be seen later, that the 12th edition does not aid in the solution at all. As this supposed "law" vitally concerns a large number of Linnean genera in all orders, and as it has not been even mentioned in a considerable number of monographs and revisions of insects including Linnean genera,* I trust the Editor will allow it to be thrashed out thoroughly.

The points raised by Mr. Blanford are:—

(1) That Linné specially indicated (in the 'Philosophia Botanica' (1751)) that officinal species were to be considered as the types of plant genera.

(2) This is to be applied to Zoology from 1758.

(3) This principle overrides all others, for type fixation.

(4) The reason for *lectularius* being fixed as type of *Cimex* is explained in the 12th edition of the 'Systema.'

(5) That *Clinocoris*, Fallén, is a synonym of "*Acanthia*."

In reply, I would again say that:—

(1 & 2) Linné mentions nothing of all this in the 10th edition of the 'Systema,' the starting point of zoological nomenclature. He himself has not carried out this rule,† and it was disregarded by his immediate pupils.

(3) There is another fundamental principle, to which I believe a greater consequence should obviously be paid, viz. that the type-species must agree with the original generic description. It is surely ridiculous to cite an apterous species as the type of a genus, part of whose diagnosis mentions without modification the presence of four wings.

(4) Mr. Blanford declares that the 12th edition of the 'Systema' ought to silence my doubts. The following is what is therein stated (tom. i. pars. 2, p. 715):—"Declaratur hæc species nunquam elytris s. alis, sed semper apterum, Larvæ aut Pupæ forma persistit, quod singulare; at in Carniolia volatilis etiam occurrat? confer Scopoli."

Now what has this to do with making *lectularius* the type of *Cimex*? It does not make it any the more conformable to the generic diagnosis, and in any case the 12th edition can have no

* I have not seen any entomological works entertaining this principle published within the last twenty-five years, but, as I do not pretend to have examined more than a restricted area of entomological literature, I have made the statement in a restricted manner.

† It will be sufficient to cite *Empis*, *Conops*, *Nepa*, *Tipula* [rectius *Tippula*], *Ichneumon*, &c., as examples of classical names misapplied, or probably misapplied, by Linné.

"say" in the matter; either *lectularius* was or was not available as type in 1758; if it was not (in 1758), nothing effected in 1766 could make it so.

(5) I quite agree with Mr. Blanford that *Clinocoris* is a mere synonym of "*Acanthia*," but he does not say which "*Acanthia*"! There are two, viz. *Acanthia*, Fabr., Latr. (otherwise known as *Salda*), a valid genus; and *Acanthia*, Fabr., Fall., type *lectularius*, which is not valid; *Clinocoris* is a synonym of the latter, and therefore is, I think, available as a substitution for this invalid *Acanthia*, Fallén.

(B) MISCELLANEOUS NOTES.

(a) In the fourth part of these notes (p. 79), I asked for information anent "*Naucorinus*." This has been kindly furnished to me by Mr. Prout, and my MS. notes are confirmed.

I think Mr. Sherborn is wrong in including *Naucorinus*, Meuschen, as a valid generic term, as there is no diagnosis, no species, no singular form, and it is almost certainly a *lapsus calami* for *Naucoris*, Geoffroy, described sixteen years previously.

The citation is "*Notonecta*, *Nepa*, *Naucorini*, *Cimices*," and the species-names mentioned are *glauca*, *linearis*, *cinerea*, *grandis*, *cimicoides*, &c., of which the first belonged, at that date, to *Notonecta*, the next two to *Nepa*, and the fourth to *Naucoris*. I do not think "*Naucorinus*" can even be cited as a synonym of *Naucoris*.

(b) In the fourth part of these papers (p. 7), for "19th Band" of Herrich-Schaeffer, read "9th Band."

(c) In the 'Entomologist' (1902, p. 316), I discussed the date of publication of the text of the "Hemiptera" in Duperrey's 'Voyage of the Coquille.*' At that time I had not seen Sherborn's paper on this matter in the *Annals & Mag. Nat. Hist.* (7), vii. pp. 388-92 (1901). Sherborn cites the date, sec. Bibl. Franç., as 1831, but this notice must surely have been taken from proof-sheets.

For the 1838 date we have (1) Guérin himself, who complains *inter alia* that Boisduval has anticipated him (in 1835) by publishing on the same subject, although knowing of Guérin's proposed work; (2) the fact that only the plates, never the text, are quoted by Laporte (1832) or Burmeister (1834-5), two of the principal hemipterists of that date; and (3) Boisduval, in the 'Voyage of the Astrolabe . . . Faune Entomologique, 1ère partie Lépidoptères' (1832), writes in an "Avis" inserted between the title-page and page 1 of the "Avertissement": that, while this first half-volume was being printed, several livraisons of plates of the entomological part of the 'Coquille' have been published.

* The tenth item under Boisduval, in Hagen's 'Bibliotheca,' p. 64, should be erased, as it is entirely erroneous.

He regrets very much that Guérin has not yet (1832) published the text, so that he could have established certain synonymy more satisfactorily than is possible from figures, which, although very carefully made, leave something to be desired for such a purpose. I cannot see my way, therefore, to quoting an earlier date than 1838 for the Hemiptera of the 'Coquille.'

(7) In my "Nomenclature of the Genera" ('Entomologist,' 1903, p. 214), I included the new genera in Burmeister's work cited here, under date of 1838, that being the date on the title-page, the date given by Hagen, and the date usually accepted by homopterists.

Unfortunately this is another case of incorrect title-page, and I now set forth all I can trace in the matter, in the hope that further information may come to light.

(a) The work was issued at irregular intervals, in parts, unpagged, undated, and with the genera unnumbered. I do not know if covers were issued, and, if so, whether these were dated.

(b) The original title was "Genera Insectorum. Iconibus illustravit et descripsit Hermannus Burmeister . . . volumen I, Rhynchota: Berolini . . . Burmeister et Stange, 1838," the preface being dated October, 1837.

(c) In 1846, after ten parts were issued, the title was altered to "Genera quædam Insectorum. . . ." "Berolini, sumtibus A. Burmeister, 1838-1846."

(d) As mentioned in (a), the parts are neither dated nor pagged, nor are the genera numbered. There is, however, an "Index generum descriptorum," dated from Halle, July, 1846, in which the genera are numbered and arranged according to their supposed affinities, not according to date of publication.

(e) The contents of each part are as follows (principally according to the 'Bericht der Entomologie') :—

- Heft 1, 1837: (?) *Lystra* (no. 20). [Ed. 2, 1840-6.]
- „ 2, 1838: *Selinocephalus* (no. 12), *Cælidia* (no. 15), *Eupelix* (no. 6), *Jassus* (no. 14).
- „ 3, 1838: *Ulopa* (no. 3), *Dorydium* (no. 5), *Cephalelus* (no. 4), *Ledra* (no. 9).
- „ 4, 1838: *Gypona* (no. 16), *Xerophlœa* (no. 8). [Also *Phthirius* and *Pediculus*.]
- „ 5, 1840: *Paropia* (no. 7).
- „ 6 or 7, 1841: *Typhlocyba* (no. 13).
- „ 8, 1845: *Fulgora* (no. 18). [With subgenus *Pyrops*, no. 19 in Index.]

(f) The *Lystra* notes are referred to in Spinola's Monograph of the Fulgoridæ (1839), so that they are probably included in the first part. The 'Bericht der Entomologie' commences in Wiegmann's Archiv for 1838, and it is there mentioned that

pts. 2-4 have been issued, so that presumably pt. 1 appeared between October and December 31st, 1837. I have not seen Wiegmann's Archiv for 1837, and do not know if there are any entomological references there. In my copy of the "Genera" there is, besides the original, a second edition of the "*Lystra*" notes, in which Burmeister refers to Spinola's monograph, and remodels his own notes and descriptions; these (including *Phenax*, which is in both) extending to 4½ sides in the first edition, four in the second, owing to smaller print. There is no clue to the date of this, but it must be between 1840 and 1846.

(g) The notes on *Eurymela* (no. 17) are referred to in Amyot and Serville's 'Hémiptères' (1843). They may therefore form part of the first part (1837?), but more probably 6th or 7th.

(h) *Typhlocyba* is recorded in the 'Bericht' for 1841; it is in either the 6th or 7th part, the remainder of these parts being devoted to beetles.

(i) *Bythoscopus* (no. 10) and *Acocephalus* (no. 11) are a puzzle. The notes on the former are referred to in Westwood's 'Introduction' (1839), so that these must apparently be referred to first part, but *Acocephalus* is referred to in *Bythoscopus*, and *vice versa*, in the "Genera"; and also in *Acocephalus*, the *Jassus* notes (14) (1838) are mentioned! So that either (1) Westwood was acquainted with Burmeister's MS. notes, (2) Burmeister referred to his own manuscripts, or (3) the 'Bericht' had imperfect copies to record from. I think the second is very likely to be the case. As I have an uncut copy, it may be useful to mention that the pages measure 140 by about 230 mill., the plates 164 by 243 mill.

(8) With regard further to Guérin's 'Iconographie du Règne Animal, Insectes,' dated on the title-page 1829-38, but mentioning 1843 in the text as early as p. 352, Guérin himself, on p. 15 (where the date 1838 is to be inferred as mentioned), states that many species have been published from his plates only, and that he considers a figure valid publication, an expression of opinion which few entomologists will share.

With regard to these plates, 55, 58, and 59 are undated; 56 is 1834; 57, 1835; with regard to the text it must be after 1843. Erichson, in 1848 ('Bericht' for 1846), states that it was scarcely published before 1845, and was not at Berlin before 1846; 1844 or 1845 may fairly safely be taken as the date, and, as the firm of Baillière is still in existence, it may be possible to trace original covers. The copy now before me contains an additional title-page, not present in the other copies I have seen. On the reverse side it states that the complete 'Iconographie' was published in forty-five livraisons, each with ten plates. There were three editions—1. 8vo, with black figures. 2. 8vo, with coloured figures. 3. 4to, with coloured figures. The text (8vo) was sold separately.

NOTES AND OBSERVATIONS.

BUTTERFLIES OF FRANCE.—I shall be much obliged if any entomologists who have collected in the following departments of France, or can refer me to local collectors, or published local lists, will communicate with me:—Oise, Aisne, Ardennes, Meuse, Meurthe-et-Moselle (later than Cantener), Yonne, Nièvre, Dordogne, Lot, Aveyron, Hérault, and the Vosges districts generally. — H. ROWLAND-BROWN; Harrow Weald.

THE ROSE SCALE.—Mr. Theobald, in his very valuable 'Report on Economic Zoology,' just published, states (p. 98) that he has not been able to detect this scale (*Aulacaspis rosæ*) in the open in Kent, Surrey, or Sussex. I may as well record, therefore, that last year I found it out-of-doors on a rose-bush in my brother's garden at Ewell, Surrey. On p. 64, Mr. Theobald gives an account of an interesting new aphid, *Siphonophora fragariella*, Theob., attacking strawberries. The generic name *Siphonophora* is a homonym, and apparently the proper name for the genus is *Macrosiphum*, Passerini, 1860. The strawberry aphid will therefore be *Macrosiphum fragariellum*.—T. D. A. COCKERELL.

HORNET AND BUTTERFLY.—Mr. Lucas's note (Entom. xxxviii. p. 282) reminds me of an incident. One morning in September, I think it was in 1893, while watching several specimens of *Pyrameis atalanta* enjoying fallen fruit in the orchard, I was surprised to see a hornet suddenly pounce on one of the butterflies as the latter was sailing round, about four feet above the ground. In a few seconds the hornet had bitten off the beautiful wings of the butterfly, and was bearing away its helpless victim between its legs. *Sic transit gloria mundi!*—ALFRED SICH; Corney House, Chiswick, Middlesex, Nov. 8th, 1905.

PHALONIA BADIANA, Hb. — I have just been reading with much interest the remarks on the larval habits of this species by Mr. Bankes (*ante*, p. 275). That the larva leaves the seed-heads of *Arctium lappa* to pupate elsewhere is undoubtedly correct. I have bred a large number, and have always found that upon leaving the seed-heads they spin their cocoons amongst the rubbish in the pot. I do not now think that they even enter the stems or roots at any time, as I have carefully examined large numbers of stems in the winter where the larva occurred commonly in September, but always without any result. I am afraid that entomologists are often "like sheep" in following statements without trying to verify them, by so doing they have in this instance most decidedly "gone astray." When I first began to collect the Tortricæ, I used to search in vain for this larva in the stems of its food-plant until I mentioned the matter to Machin, and he remarked: "You will never find them *there*, as they always spin up amongst the rubbish upon leaving the seed-heads, in which I have always found them." The next season I was able to confirm his statement. With regard to Mr. Bankes's inability to find Mr. Maling's note, quoted by Sorhagen, I think that I can throw a glimmer of light on the matter. In the 'Entomologist,' vi. 283, Machin (in a list of insects reared in 1872) gives "*A. badiana*, bred from seed-heads of

Arctium lappa "; and on the same page there is a short list of captures by Maling, although he does not mention *badiana*, yet, curiously enough, he records the very closely allied *cnicana* ! Is it not possible that Sorhagen may have got a little mixed with the two very similar names—Machin and Maling ?—A. THURNALL; Thornton Heath, November 2nd, 1905.

METHOD OF OVIPOSITION BY *CORDULEGASTER ANNULATUS*.—During a visit to Cornwall in August of this year, I had the opportunity of observing very closely the mode of procedure of *Cordulegaster annulatus*, Latr., during oviposition. The account given in Lucas's 'British Dragonflies' reads thus : "The female does this apparently by dipping the tip of her abdomen in the water at random." This is completely borne out by what I saw ; but as I was able to watch the insect at very close quarters for some ten minutes, it seemed that a short account might be of interest. The locality was a spot on the cliffs going from St. Ives to Zennor, shortly after the basalt gives place to the granite. A small stream running across the moorland towards the sea was connected with some small pools of comparatively still water. Whilst hunting for marsh plants by the side of one of these pools a large female *Cordulegaster annulatus* came to rest upon the wing within a couple of feet of me where I knelt, and after remaining poised upon the wing for a few seconds, suddenly bent the posterior portion of her abdomen at right angles to the anterior portion, and commenced rising and falling on the wing. The end of the abdomen was thus repeatedly thrust into the soft mud at the edge of the pool, the insect rising between each thrust to a height of some six inches. About seventy to seventy-five thrusts were made per minute, and this was continued for nearly ten minutes in the same spot. The female was not accompanied by the male. In depositing its eggs while hovering on the wing, *Cordulegaster annulatus*, Latr., agrees with *Sympetrum striolatum*, Charp., *S. flaveolum*, Linn., *S. scoticum*, Don., *Libellula depressa*, Linn., *L. quadrimaculata*, Linn., and *Aeschna juncea*, Linn. ; but of these, the first three are accompanied by the male insect. In apparently laying its eggs in the mud it agrees with *Agrion mercuriale*, Charp.—ERIC DRABBLE, D.Sc., F.L.S. ; Hartley Laboratories, The University, Liverpool.

PROLONGED PUPAL STAGE IN *EMMELESIA UNIFASCIATA* (*PERIZOMA BIFASCIATA*).—Some fifty larvæ of *Emmelesia unifasciata*, collected in the autumn of 1900, pupated during the latter part of October and the first few days of November of that year. In August, 1901, ten moths emerged ; in 1902, eleven ; in 1903, two only : in 1904, five ; and in 1905, two : these last having thus passed five winters, and in point of time four years and nine months in pupa. No attempt was made to artificially retard emergence, the pupæ having been kept under as nearly natural conditions as may be practicable in confinement, the earthen pan containing them remaining out of doors during the whole period, exposed to the weather but sheltered from direct rain, and in a position where it would receive a fair amount of sunshine. It is, I believe, a well-known habit of this species to lie over as a pupa for more than one winter, but it appears to be pretty generally believed that the second or, perhaps, the third year is

the limit of its endurance. The above, however, shows that, under favourable conditions, *i.e.*, protection from predatory enemies, &c., its vitality will enable it to withstand a much longer period and still produce perfect imagines.—ROBERT ADKIN; Lewisham, November, 1905.

EARLY HYBERNATION OF *VANESSA URTICÆ*.—Seeing the record on the above subject (page 281) has induced the following note. Every autumn the ceiling of a certain staircase in this house is the resort of one, or more, hibernating *V. urticæ*, but this season, at the *beginning of July*, I noticed a specimen, in fine condition, had taken up its quarters upon a slanting part of the ceiling, wings erect, head downwards, legs spread out, and antennæ neatly folded back as usual. I see it is there to-day in exactly the same position, and is the only one taking advantage of the retreat. The question naturally arises—what is the cause of hybernation? It cannot be a feeling of the approach of winter or lack of food in this case, as the temperature was far more summer-like after the insect had settled than it was before, and the situation is comparatively well lighted, so that the insect could not have mistaken dusky surrounding for the shortening days of autumn. I shall watch its motionless repose with interest, unless the broom dislodges it, for doubtless it has been noticed that this very necessary and useful instrument and hibernating insects are somewhat at variance.—G. B. CORBIN; Ringwood, November 14th, 1905.

PARTIAL SECOND BROOD OF *SPILOSOMA MENTHASTRI*.—A female specimen of *S. menthastri*, captured in Kensington in May last, deposited just over one hundred eggs. The larvæ fed up rapidly, and, excepting a few that died when full grown, pupated. Twenty-one imagines emerged during the latter part of August and beginning of September, and there are now (November 20th) thirty apparently healthy pupæ still remaining. The majority of the specimens reared favour the female parent in the amount and style of the black maculation, as well as in the ground colour, which is of the normal white. Some, however, have the ground colour creamy; others have few black spots; and one example has only one spot about the centre of the fore wings, and two or three towards the outer margin.—E. G. GENTRY & W. E. PHILLIPS.

EPIBLEMA (*PHILGODES*) *IMMUNDANA*, F. R. — With reference to Mr. A. Thurnall's note (*antea*, p. 281) on this species, I cannot explain the apparent absence of the white-blotched form from among the first-brood specimens in his district; but my own experience by no means accords with his. For whereas, among large numbers of examples of the earlier brood, he has not seen any with the dorsal blotch "nearly or quite pure white," I find that, out of the twenty-one bred and captured representatives of this same brood from the Isle of Purbeck, that have remained with me, nine are of this form which his experience leads him to believe only occurs in the later generation. It is quite likely that everywhere a larger proportion of the second, than of the first, brood would have the dorsal blotch white, as the result of the well-known tendency (acting on an inherent tendency towards this style of marking) shown by species to produce paler imagines if their metamorphoses are

completed rapidly than if these are retarded. If, as seems probable, the eggs laid by the second-brood moths hatch about September (Sorhagen, Kleinschmet. d. M. Brandenburg, 112, definitely states that they do so in the "autumn"), this period will be fully double as long in the case of the first, as in that of the second, generation. The form with the dorsal blotch white is the true *immundana*, F. R., while that in which it is dark is var. *estreyeriana*, Gn. Although Mr. Meyrick, in H. B. Brit. Lep. 493 (1895), enters *E. immundana* as only single-brooded, as also did Heinemann in Kleinschmet. Deutsch. u. d. Schweiz, B. i, H. i, p. 158 (1863), the existence of a second brood in England, as well as on the Continent, has been long known, and is recorded in Wilkinson's Brit. Tort. 82 (1859); Stainton's Manual, ii. 208 (1859); Morris's Brit. Moths, 175 (1868); Entom. xiii. 111 (1880); Snellen's Vlind. v. Nederland, Microlep. 335 (1882); Young Nat. v. 206 (1884); Sorhagen's Kleinschmet. d. M. Brandenburg, 112 (1886); Tutt's Prac. Hints, ii. 42 (1902), etc. In this last work it is said to be only partially double-brooded, but it seems likely that, at any rate in many districts, it is completely and regularly so. Again, Meyrick gives the larvæ of the April-May imagines as feeding in July and August, whereas in this and various other localities, both English and Continental, the larvæ that produce the April-May moths hatch out in the autumn (*teste* Sorhagen, *l. c.*), live inside the birch and alder catkins, and can be collected, about full-fed, in plenty therein during the end of February and March. The larvæ that produce the later brood feed on the leaves of these trees in June and July, and the moths emerge about August. — EUSTACE R. BANKES; Norden, Corfe Castle, Nov. 10th, 1905.

NEW WORK ON BRITISH BUTTERFLIES.—We have received Part i. of 'A Natural History of the British Butterflies,' by J. W. Tutt, F.E.S. Pages 1-4 are occupied by general observations on butterflies and part of a chapter dealing with egg-laying. These items appear to be an instalment of the Introduction. The familiar *Hesperiidæ* are in future to be known as *Urbicolides*, and the author's reasons for this change will be found in the following passage, extracted from his remarks on the superfamily:—" . . . in 1758, Linné separated (Syst. Nat., x., 482) the smaller butterflies—hairstreaks, blues, coppers and skippers—under the title *Plebeii*, and further subdivided (*op. cit.*, pp. 482, 484) them into the *Rurales* and *Urbicolæ*, the latter being, even at this time, absolutely restricted to the 'skippers.' Pallas, in 1771, Fabricius, in 1775, 1781, and 1787, and Esper in 1776, maintained the Linnean name. In 1780 Goeze called them the *Urbicolæ*, and in 1781 Barbut, using *Urbicola* in a truly modern generic sense, fixed the type of the genus as *comma*, Linn., No. 256, whilst in 1788 Borkhausen subdivided the Linnean *Rurales* into the *Subcaudati* (hairstreaks), *Rutili* (coppers), and *Polyophthalmi* (blues), keeping, however, the Linnean name *Urbicolæ* for the skippers; whilst, more important than all, Fabricius himself, in renaming the group (Ent. Syst., iii., 258) in 1793, *Hesperia*, retained the Linnean sub-divisions calling the blues, &c., the *Hesperia-Rurales*, and the skippers the *Hesperia-Urbicolæ*. So far, therefore, as Linné's group names—*Papilio*, *Nymphalis*, *Plebeius*, *Ruralis*, *Urbicola*, &c.—have any classificatory and nomenclatorial value, it is

clear that the 'skippers' must be called the Urbicolides, and its typical genus, of which Barbut named *comma*, Linn., No. 256, the type, *Urbicola*." Possibly this action on the part of the author may be perfectly legitimate, but we fear that its acceptance as a new starting-point will still further delay the establishment of anything durable in the way of classification, or, at all events, the nomenclature thereof. As such matters are, however, still open to discussion, we will dismiss them from the present notice and turn to the less debatable contents of the initial part of this new text-book. Acquaintance with the author's other volumes on British Lepidoptera had prepared us for masterly and exhaustive treatment of the Butterflies, and we certainly are not disappointed. First of all, the superfamily is dealt with as a whole, and including remarks on the general biological structure of the Urbicolids (pp. 81-90). Then follows a consideration of the subfamily Thymelicinæ, tribe Thymelicidi (pp. 91, 92), with an account of *Adopæa lineola* (pp. 93, 104). It is presumed that the pages 5 to 80 yet to come will be occupied by further introductory matter, but there is no mention of this. The book will be found exceedingly useful to everyone interested in our butterflies, but to the student in the higher branches of entomology it will be indispensable. There is a well-executed plate of Urbicolid ova, reproduced from photographs taken direct from the eggs.

CAPTURES AND FIELD REPORTS.

LATE FLIGHT OF DRAGONFLIES.—Mr. C. W. Dale forwards the following records: *Æschna mixta*, October 17th, 1807; *Æ. cyanea*, November 3rd, 1834; *Sympetrum scoticum*, October 22nd, 1816; *S. striolatum*; October 3rd, 1863. On November 12th last I saw a dragonfly on the wing at the Black Pond, near Oxshott, which must have been *S. striolatum*, and I have seen the species as late as November 14th. At the same time I saw *S. scoticum* on November 2nd, in 1902.—W. J. LUCAS.

CAMPODEA STAPHYLINUS.—This insect was taken at Weymouth and Portland in May, 1893, by Mr. G. Worth.—C. W. DALE; Glanvilles Wootton.

DEILEPHILA LIVORNICA BREED FROM THE EGG.—On June 6th of last year my good friend Dr. Crallan, of Bournemouth, sent me four ova of *D. livornica*, from a batch laid by a moth captured in that town. One of these unfortunately hatched out during transmission. The next day the three remaining ova hatched. I fed the larvæ on vine-leaves, till in due time they pupated. I am sorry now that I did not force them, as two dried up. However, I was rewarded with one fine insect, which emerged in the first week of September.—JOSEPH ANDERSON; Chichester.

LUCANUS CERVUS AT CHICHESTER.—The stag-beetle (*L. cervus*) was by no means uncommon here during the past summer.—JOSEPH ANDERSON.

SIREX GIGAS AT CHICHESTER.—This handsome "giant" saw-fly made its appearance here during the past season. Single specimens may be met with nearly every summer, but many years have passed since *Sirex juvenicus* has been seen.—JOSEPH ANDERSON.

XYLINA SEMIBRUNNEA IN REIGATE.—While working ivy-bloom in Reigate, on November 14th, I took a fine specimen of *X. semibrunnea* on an exposed head from which all the bloom had fallen, leaving only the hard seed-heads. I am told by a Lewes collector that he finds the ivy-bloom most attractive when it is falling. Is this the experience of other collectors?—A. J. WIGHTMAN; 28, Station Road, Redhill.

LEPIDOPTERA AT LIGHT IN REIGATE IN 1905.—I have this year taken the following insects at light here, which I did not take in 1904:—*Drepana binaria*, *Ptilophora plumigera*, *Demas coryli*, *Luperina cespitis*, *Miana fasciuncula*; while several insects, abundant in 1904, did not turn up at all, viz., *Cirrhædia xerampelina*, *Plusia chrysitis*, *Hydræcia micacea*, *Pachnobia rubricosa*.—A. J. WIGHTMAN; 28, Station Road, Redhill.

SPHINX CONVULVULI IN SOUTH-WEST LONDON.—I beg to report the capture of a specimen of *S. convulvuli* at light, on Wimbledon Common, on October 15th, 1905.—CLAUD E. L. ELLIS; 17, Telegraph Street, London, E.C.

ODONATA IN HERTS, 1905.—A gravel-pit and several ponds were searched near the village of Shenley. On June 13th, *Agriion puella*, *Enallagma cyathigerum*, and *Ischnura elegans* were on the wing in great abundance; and three *Pyrrhosoma nymphula* (all males) were captured. On June 14th some specimens of *Libellula depressa* were captured, and also one *P. nymphula* female, flying along a hedge. On June 14th two *Erythromma najas* (males) were taken, at one of the ponds where *E. cyathigerum* and *I. elegans* were abundant. On June 15th an *E. najas* female was captured, and another female on June 16th. On July 15th two more *E. najas* (males) were captured, and two females were seen. In August and September *Sympetrum striolatum*, *Æschna grandis*, and *Æ. cyanea* were abundant. On August 22nd a species of *Lestes* turned up in the gravel-pit. It seemed to be *L. dryas*, but the specimen has not been satisfactorily identified so far.—E. R. SPEYER; Shenley, Herts.

A NEW FOREST HOLIDAY.—As I alighted at Lyndhurst Road Station one afternoon towards the end of last June, I could not help contrasting the weather with that which I had experienced on my arrival at the same spot on a day in late July, 1903. Then, great clouds of fine rain were sweeping continually across the country, and the forest was a mass of bog and swamp; now, the temperature was nearly eighty degrees in the shade, and the forest was indeed the Mecca of the entomological wanderer. On my former visit, the rainfall almost created a record for July and August; this time, day followed day of brilliant sunshine, making the collecting of insects, if at times a somewhat warm occupation, yet always a most delightful one. Very soon after my arrival I was, on Lyndhurst Common, to be greeted at once by a conspicuous *Nemeophila russula*. The males were about in some numbers, though I saw but a single female. As dusk

fell, *Agrotis porphyrea* was common and *Hepialus hectus* abundant. On my first morning, June 28th, I walked through the woods towards Stubby Copse to see what butterflies were about. *Argynnis selene* was numerous in places, and I caught sight of the first specimen of those future swarms of *A. paphia* which were soon to enliven the ridings. *Limenitis sibylla*, most graceful of insects, was just appearing in the freshness which it so quickly loses, and on the heaths were early arrivals of *Lycæna ægon*. In the pine-woods one could not walk far without disturbing *Macaria liturata*, and more seldom *Thera variata* and *Ellopiæ prosapiaria* (*fasciaria*), while *Bupalus piniaria* fluttered from every pine-tree. Elsewhere in the forest, on the first day's excursion, we took specimens of *Gnophria rubricollis*, *Epione advenaria*, *Phorodesma bajularia*, and a number of *Calligenia miniata*. Returning by the heath, *Aspilates strigillaria* and *Panagra petrararia* were knocked out. Later on, the heaths yielded several good insects. Notably *Gnophos obscurata*, which was first beaten out—or, perhaps, considering its subterranean hiding-place, it would be more exact to say, "scraped out"—on July 4th. In a few days the moth was very common here and there about the heath, and in half an hour's scraping in a favourite spot, I more than once counted from fifty to sixty specimens flying up. The males were ten times as numerous as the females. Paler forms were infrequent, but on the whole they varied from black to a fairly light grey. Another geometer, of which I took a few on the heath during the second week of July, was *Pachycnemis hippocastanaria*; and several chases of that most agile of day-flying Noctuæ, *Heliothis dipsacea*, resulted in the capture of a single specimen. Other geometers, met with at odd times in excursions through the forest, included *Angerona prunaria*, *Iodis lactearia*, *Hyria auroraria*, *Macaria notata*, *Cleora glabraria*, *C. lichenaria*, *Eurymene dolobrararia*, and *Acidalia imitaria*. Denny Bog is generally a productive hunting-ground. It is not, however, the pleasantest of spots for dusking. Even in the driest summer there is a somewhat odorous dampness rising at sunset. In 1903 it was utterly impenetrable, but this year I took, amongst others, at dusk, *Ephyra orbicularia*, *Eucosmia undulata* (common), *Cleora glabraria*, and *Lithostia mesomella*. Most of the evenings were too still and dewy to make sugar very productive. However, *Aplecta nebulosa* was always abundant, and I was in time to secure a short series of *Moma orion*, as well as *Thyatira batis*, *T. derasa*, *Acronycta ligustri*, *Cymatophora or*, *C. duplaris*, and *Agrotis herbida*. An unusual visitor to sugar was a female *Psilura monacha*, and I was surprised one evening by *Cossus ligniperda* fluttering at the bottom of a sugar-patch.

On July 14th we made an excursion to Swanage, to renew acquaintance with *Hesperia actæon*. It was in fine condition, and abundant in places, though I found the species in a spot more inland than when I visited the locality last. They are accompanied by *Hesperia linea*, from which they are easily distinguished on the wing after a little practice. *Melanargia galatea* was also about, and a fritillary, probably *Argynnis aglaia*. This inland migration, if such it be, is to be regretted, for so, the skipper will run a much greater risk of extermination than when its breeding-ground is the difficult slope of the cliff. What hosts of common butterflies were enjoying that

wonderful weather! Amongst innumerable *Epinephale ianira*, I had the good fortune to see, and capture, in Denny Wood, a very fine male with a large symmetrical cream-coloured area in both upper and lower wings. On my visit in 1903 I took a quite white specimen of *Ctenonympha pamphilus*, similar to one I caught in Norfolk some twelve years ago. It seems possible, however, that these white varieties of *C. pamphilus* are merely faded. *Valesina* was first seen on July 8th. In all I counted eleven between then and the 20th, and many of them were unaccountably damaged. *Vanessa polychloros* appeared on July 17th, and *Lycana argiolus* on the same date. *Thecla quercus* seemed quite rare, and I did not see more than a dozen all the time. *Limenitis sibylla* was abundant in many parts of the forest. I was anxious to net *Aputura iris*. Its larvæ may be obtained here for a few pence, or they may be beaten from sallow; but these are unworthy methods of securing such a noble insect. It was not, however, till my last day's collecting, on July 20th, that I got within reach of *iris*. Then, in a riding of Wood Fildley, I stalked one as it sat upon a frond of bracken, and with a lucky stroke bagged my first emperor, or, to be more correct, empress. I think the satisfaction of netting *A. iris* must rather exceed that of the man who purchases the larva, even at a reduced price for taking a quantity. It was warm work, those July days in the forest ridings, when the London thermometers stood in the eighties, and few things can equal the pleasure with which, having shaken off the swarm of pursuing flies, one attacks one's tea (those New Forest teas!) after such a day spent in tramping the heaths and woods, and sprinting after elusive Lepidoptera. — S. L. ORFORD YOUNG, M.B.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 18th, 1905.—Dr. T. A. Chapman, M.D., F.Z.S., Vice-President, in the chair. — Mr. Charles William Bracken, B.A. (Lond.), of 18, Whiteford Road, Mannamead, Plymouth; and Mr. William Hubert St. Quentin, of Scampton Hall, Rillington, York, were elected Fellows of the Society.—Mr. H. Rowland-Brown exhibited series of *Erebias* taken this year in the Pyrenees, including *Erebia lefebvrei*, with the vars. *pyrenæa*, Obth., from Mont Canigou, E. Pyrenees, and var. *intermedia*, Obth., from Gavarnie. He also showed, for comparison, *E. glacialis* var. *nicholli* from Campiglio, which at one time was supposed to be identical with *lefebvrei*, then considered to be the Pyrenean form of *E. melas*. With them were arranged specimens of *E. gorgone* and *E. gorge* from the Lac de Gaube, Cauterets, and from Gavarnie; and a short series of *Lycæna orbitulus* from the Central Alps, *L. orbitulus* var. *oberthuri*, Stgr., *L. pyrenaica*, and *L. pheretes* from the Brenner and Cortina districts. It was remarked that there seemed to be a greater superficial affinity between *pyrenaica* and *pheretes* (not reported from the Pyrenees) than between *pyrenaica* and *orbitulus*.—Mr. E. C. Bedwell, eight specimens of *Apion lavigatum*, Kirby, one of the rarest indigenous Apions, found on August 31st, sheltering under plants of *Echium*

vulgare in the Lowestoft district.—Mr. S. Shelford showed a Ligæid bug the fore-limbs of which were remarkably well adapted for fossorial habits, and comparable with those of the mole-cricket; a Brenthid beetle with a deep channel running along the dorsal part of the prothorax and occupied by acari; and an Anthribid beetle with a crescentic sulcus for the reception of acari on the prothorax. All the specimens were from British North Borneo.—Mr. C. J. Gahan, on behalf of Mr. C. O. Waterhouse, exhibited a living example of *Phaneroptera quadripunctata*, which species had been found in some numbers in a vinery near Chester.—Mr. W. J. Kaye brought for exhibition a long variable series of *Heliconius numata*, from the Potara River, British Guiana, clearly proving that these very variable forms were only aberrations, and were not subspecies, at least in this locality. A pair of *Heliconius silvana* were also shown with two rare aberrations, showing the black area of the hind wing divided; and examples of *Heliconius vetustus*, it being remarkable that although similar to *numata* it was nevertheless a distinct species.—Mr. A. H. Jones exhibited a collection of Lepidoptera made by him in Majorca during the first half of last June, and remarked upon the great scarcity of lepidopterous species in the island. Only thirteen kinds of butterflies were observed, and these without any indication of variation, with about six species of moths (all occurring in Britain), including *Agrotis saucia*, *Acidalia ochrata*, and *A. degeneraria*, the latter, interesting in point of colour, being much redder. He also exhibited *Melanargia lachesis* var. *canigulensis*, from Le Vernet, showing on the under side in the males a strong resemblance to *M. galatea*; also *Melitæa aurinia* var. *iberica*, Obth. (*desfontainii*, Rbr.), from Montserrat, near Barcelona; and a melanic specimen of *Erebia stygne*, taken by Mr. R. S. Standen at St. Martin du Canigou, Le Vernet.—Mr. Frank P. Dodd communicated a paper "On a Parasitic Lepidopteron from Queensland, Australia."—Commander J. J. Walker read a paper by Mr. E. G. R. Meade-Waldo, "On a Collection of Butterflies and Moths made in Morocco, 1901-2." The species enumerated included a *Cænonympha* new to science. But for so luxuriant a country as that visited it was remarkable how few butterflies and moths were observed.

November 1st.—Mr. F. Merrifield, President, in the chair.—Mr. J. W. H. Harrison, B.Sc. (Lond.), of The Avenue, Birtley, was elected a Fellow of the Society.—The Rev. F. D. Morice exhibited (1) *Panurgus moricei*, Friese; a species of bee new to science, taken by him near Gibraltar, of which it was remarkable that whereas species of this genus are entirely black, in this species the male face entirely, and the female partly, was bright yellow, the legs partly yellow, and the abdomen spotted down each side, very much as in *Anthidium*; and (2) the unique type-specimen of *Heriades fasciatus*, Friese, a male of the *Chelostoma* group, taken by him at Jericho in 1899, in which, again, while all its congeners are practically unicolorous, the abdomen is brightly banded, not unlike that of a wasp. A discussion followed as to the reason of the peculiar coloration in the species under review, the exhibitor pointing out that the colour mimicry in this species could not be due to parasitism, both *Panurgus* and *Heriades* being industrious genera.—Mr. W. J. Lucas showed a male specimen of the earwig

Forficula auricularia, taken at Warwick in September last, with a drawing of the cerci (forceps), which were very abnormal, the broader basal part of the two appearing to be more or less fused together, while the legs of the forceps were jointed to the basal part. The case, he said, was interesting because in cockroaches, &c., the cerci are regularly jointed.—Mr. G. C. Champion exhibited various interesting insects from Guatemala recently received from Señor Rodriguez, including *Heterosternus rodriguezi*, Cand., *Pantodinus kligi*, Burm., *Plusiotis adelaida*, Hope, and a species of Orthoptera greatly resembling a dead withered leaf, possibly a new species of *Mimetica*.—Mr. Norman H. Joy showed two species of Coleoptera new to the British Islands: *Lamophilus monilis*, F., taken in the neighbourhood of Streatley, Berks; and *Dacne fowleri*, n. sp., from Bradfield, with specimens of *D. humeralis* and *D. rufifrons*, for comparison.—Mr. H. St. J. Donisthorpe showed a specimen of a new *Agathidium* discovered last year in Cumberland, and since taken by him in Durham; and a series of *Priocoryphus serriicornis*, with a drawing of the larva.—Dr. F. A. Dixey exhibited preparations of the scents of some African butterflies collected by him and Dr. Longstaff during the recent visit of the British Association, also specimens of the species investigated. A discussion on the presence and use of scents in various orders of insects followed, in which the President, Professor Poulton, Col. C. T. Bingham, and other Fellows joined.—Mr. P. I. Lathy, F.Z.S., communicated "A Contribution towards the Knowledge of African Rhopalocera."—Col. C. T. Bingham contributed a paper entitled "A New Species of the Hymenopterous Genus *Megalyra*, Westwood, by J. Chester Bradley, Ithaca, N.Y., U.S.A."—H. ROWLAND-BROWN, M.A., *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 26th, 1905.—Mr. Hugh Main, B.Sc., President, in the chair.—Rev. E. Tarbat exhibited a specimen of *Pseudoterpnæ pruinata* (*cytisaria*) from Morthoe, in which the usual green colour was replaced by a rich yellowish brown; it was in bred condition.—Mr. Kaye, an extremely light form of *Boarmia abietaria*, bred from a Box Hill larva. It was noted that this species was generally much darker now than years ago in that locality, but none were as light as the specimen shown.—Mr. Step, a larva of the New Zealand "vegetable caterpillar" *Hepialus virescens*, and the fungus *Cordiceps robertsii*, which attacked it.—Mr. West (Greenwich), the following Hemiptera: *Drymus sylvestris* var. *ryei*, uncommon, under dead leaves; *D. pilicornis*, very local; and *Berytus crassipes*, rare, under stones; all from Box Hill.—The remainder of the meeting was devoted to an exhibition of lantern slides by the members, illustrating animals and plants in nature, protective resemblance in insects, curious abnormal growths, our British heaths, microscopic life, insect metamorphoses, and views taken during the field meetings.

November 9th, 1905.—The President in the chair.—Mr. Stonell exhibited, (1) a selected series of *Heliophobus hispidus* to show the very small variation in British specimens; (2) a long series of *Taniocampa gothica* and its var. *gothicina*, extremely varied, some of the latter form having the "gothica" mark obsolete; (3) *Callimorpha dominula*, with yellow hind wings; (4) *Ægeria* (*Sesia*) *tabaniformis*, from the Gregson

collection; (5) extremely dark forms of *Agrotis nigricans*; and (6) a melanic *Larentia multistrigaria*.—Mr. Moore, a collection of Orthoptera from South Africa.—Messrs. Harrison and Main, a short series of *Aicialia aversata* bred from a female taken at Bude. Six were reddish and banded like the parent, five were ordinary putty-coloured, four with no band, one with a very dark band.—Mr. R. Adkin, (1) specimens of *Pararge egeria* from Shaldon, September 21st, 1905, one of which was extremely dark, compared with others taken at the same time; (2) a series of *Dryobota (Hadena) protea*, reared from ova; he read notes on the breeding and habits of the larvæ.—Mr. Main, pupa cases of *Pyrameis atalanta* and *P. cardui*, and also pupæ of *Pieris napi* showing great variation in the number and intensity of the black markings.—Mr. Goulton, a box of insects he was presenting to the Society's collections, including a series of *Geometra vernaria*.—Mr. Rayward, a very fine series of bred *Polyommatus bellargus* from Reigate, and contributed notes.—Mr. Scourfield, F.R.M.S., then gave an address on "Mendel's Law of Heredity," and exhibited specimens and diagrams in illustration of his remarks.—HY. J. TURNER, *Hon. Rep. Secretary*.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—October 3rd, 1905.—The President in the chair.—Rev. C. R. N. Burrows, a series of *C. punctaria* bred from ova laid by Brentwood female.—Mr. J. A. Clark, *G. obscurata* taken at Folkestone during first week in August, of somewhat dark coloration for chalk district.—Mr. Heath, one *L. albipuncta* from Sandown, Isle of Wight, September 7th, 1905; a series of *C. ferrugata* bred from Eynsford female; and a series of *L. deplana* from Box Hill.—Mr. E. Harris, a beetle found under the bark of a log of Gold Coast mahogany, also larvæ found in the same log; both unidentified.—Mr. Harrison, *C. davus* from Cheshire and Isle of Lewis; those from the latter locality were paler generally, and had the white cilia much more accentuated than the Cheshire specimens.—Mr. Pickett, a long series of *C. dominula* bred from Deal larvæ, the brood producing seventy-four females and eighty-six males; also two examples of *S. hyperanthus* var. *arete*, Folkestone, July 15th, 1905; and a male *S. ianira*, in which the usual bright brown area on both the upper and lower wings was replaced by a creamy shade.—Mr. Kaye also exhibited *C. dominula*.—Mr. Prout, a short series of *N. neurica* from the East Kent marshes, including four examples of the black var. *hessii*, which is not known to occur in the Norfolk Broads, where this species is plentiful.—Mr. Riches, *C. porcellus* bred from Eastbourne larvæ, and *A. aceris* from Hornsey, including a very dark specimen.—Mr. Shaw, *C. propugnata*, second brood from Eynsford ova, which emerged on July 29th and 30th, 1905.—Mr. Bacot stated that an escaped larva of *E. cardamines* that had "spun up" on a dark chair-leg in a corner of a room had produced a very dark pupa.

October 17th.—The President in the chair.—New member: Mr. Edelsten proposed, and Mr. Prout seconded, Mr. E. A. Bowles.—Mr. Bell, a series of *H. actæon* taken at Swanage on July 21st, when the insect was abundant.—Mr. Benton, two specimens of *C. pamphilus*, Purley, June, 1905, one with marginal band very deep and dark, and the other with ocellus on under side of one wing almost obsolete; also two

A. filipendulæ, each with one under wing partially bleached, and an example of *S. hyperanthus* with one upper wing in a similar condition.—Rev. C. R. N. Burrows, seven pupæ of *P. machaon* reared from ova; of these, five, having pupated on carrot stems, were pale green, while the remaining two, one of which pupated on glass, and the other on muslin were dark grey in colour: also three cocoons of *C. furcula* on three different woods, each closely resembling its base. The exhibitor pointed out that in the latter case the protective coloration was obviously produced mechanically.—Mr. Edelsten, a long series of *C. russata* bred from ova laid by a typical female taken in the Norfolk Broads; the specimens ranged from the type through var. *comma-notata* to var. *perfusata*, with many fine intermediate forms; also *N. plecta*, from South Devon, with the usual pale costal streak suffused with the ground colour; and from Norfolk, with this streak very prominent.—Mr. Kaye, a fine series of *C. elpenor* bred from larvæ taken near Basingstoke Canal; although it is generally stated that this larva will not accept a change of food-plant, Mr. Kaye, having found the larvæ on yellow balsam, had no difficulty in feeding them up on willow-herb.—Mr. Mera, *A. sinuata* from Cambridge.—Mr. Pickett, *P. phlæas* from Dover, August, 1905, with spots on hind wings elongated so that they coalesced with the marginal band; also *B. perla* from Torquay, Folkestone, and Southend, those from the latter locality having the orbicular and reniform very strongly marked.—Mr. Riches, *G. smaragdaria*, bred, from Essex marshes, including a specimen with the two left wings much paler than the right-hand pair; also *M. fluctuata* var. *costovata* from Hornsey.—Mr. Shaw, *A. lucerneæ* taken at valerian at Torquay on July 18th, and a larva of *Enophila v-flavum* mounted for the microscope.—Mr. Harris stated that the beetle exhibited by him at the previous meeting was *Cordylomera suturalis*.—Mr. Kaye reported the capture of one *X. semibrunnea* at ivy near Leatherhead.—S. T. BELL, Hon. Sec.

DUPLICATES AND DESIDERATA.—We always desire that those of our readers, who wish to do so, should have full opportunity of making known their requirements through the medium of our "Exchange" pages. Of late years, however, it seems to have become usual to reserve the majority of such notices for the last four months of the year. To find room for the large number of these lists, sometimes received, it has occasionally been necessary to curtail some of the more lengthy of them. May we venture to suggest that it would be a convenience all round if lists for the "Exchange" could, during the period mentioned at least, be condensed into about six lines each? Please note that lists for the "Exchange" should be sent in on or before the 25th of each month, and should not at any time be crowded on a postcard.



For
IN LIBRARY
ONLY
NOT REMOVE
LIBRARY

595.705
E6147
V. 38
1905

Use a Temporary book card.

NON CIRCULATING
DO NOT REMOVE
FROM THE LIBRARY

